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**Recommendations Proposed by the
Federal Task Force on Digitization**

FINAL REPORT

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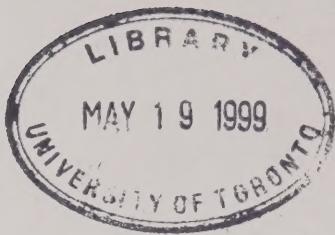


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A. BRIEF OVERVIEW

The Federal Task Force on Digitization was proposed by the ministers of Canadian Heritage and Industry in their May 1996 response to the Information Highway Advisory Council (IHAC) Phase 1 Final Report, *Connection, Community, Content* (1995). In its report, IHAC stressed the importance of Canada maintaining a strong presence on the Information Highway in both official languages and highlighted the opportunity for government to provide Canadian content by transforming its vast holdings of information, art, artifacts and scientific collections into digital form. The Task Force was established in April 1997 to identify issues and to propose mechanisms that will facilitate electronic access to this wealth of Canadian content.

Recent advances in information and communications technology are presenting exciting opportunities for creating, converting, marketing, distributing and exporting digital Canadian content. As a communications vehicle, the Information Highway provides the Government of Canada with the opportunity to fulfill its responsibilities in the generation and dissemination of information in a more effective, efficient and timely manner.

At the same time, the provision of digital information provides new ways for government to meet its cultural, social and economic policy objectives. Not only does it increase access to and knowledge of the Canadian experience, but it also fosters opportunities for innovation, wealth and job creation in the Canadian content and multimedia industries.

The opportunities presented by digitization will increase as the transition to the digital environment accelerates. But many challenges arise for government as it adapts to the digital environment. Most government information holdings and legacy collections are in analogue format, and resources will be needed to support selective conversion into digital format. Effective means are needed to protect intellectual property rights of authors in digital works and to facilitate the efficient and effective clearance of rights. The increasing availability of a host of information technology standards has the potential to reduce interoperability and interconnectivity. Even with the growth of digitally available government information, for the foreseeable future it will remain important for the federal government to continue providing certain types of information in conventional formats for those Canadians who do not have the technology or skills to access digital content.

To better understand the many opportunities and challenges related to digitization activities in the federal arena, the Task Force identified and investigated five research areas, which form the basis of the proposed recommendations:

- *Issue 1:* Accessibility of Digitized Content
- *Issue 2:* Selection of Materials for Digitization
- *Issue 3:* Common Issues of Intellectual Property
- *Issue 4:* Identification of Standards and Best Practices
- *Issue 5:* Funding Strategies for Digital Conversion

The proposed recommendations support the Task Force's vision that advancements in information technology are a means to enhance access to the federally held cultural,

economic and scientific collections and information holdings. By strengthening and building upon the existing federal legislative, policy and operational framework, an enabling environment for expanding access to information in digital form will be possible. The objective is to provide a strategic framework to facilitate effective and efficient creation, development and distribution of, and access to, electronic federal information holdings and collections. The recommendations promote the concept that the federal government should act as a *model user* and *catalyst* for the creation of, and provision of access to, Canadian content on-line and off-line.

As the Information Highway continues to evolve at an increasing pace, the federal government will need to position itself strategically to take advantage of the opportunities and address the challenges of the digital world. Never has there been a greater need to pursue a coordinated and horizontal approach to federal communication and information dissemination responsibilities. Recognizing that Crown corporations, agencies and federal departments have differing mandates and legislative requirements, a cooperative, yet flexible approach to implementing the recommendations will accelerate and support the transition to a knowledge-based economy and society.

The response of federal departments, agencies and Crown corporations to the first draft of this report made it clear that the report has met its objectives of defining and clarifying issues and encouraging reflection, debate and action on their implications. While many comments have been reflected in this report, others will need to be addressed in Phase I of the implementation process. Repeatedly, federal institutions expressed their concern about the urgency of addressing the identified issues surrounding digitization, the need for immediate action, and the importance of maintaining the momentum created by the work of the Task Force.

This report represents an important starting point on the subject of digitization. With high-level Task Force representation from 21 federal institutions, it reflects the first collective discussions on this topic. These discussions have benefited from the experience and expertise of those federal institutions that have been and are actively making digital information available. But until recently they did not, to the same degree, have the benefit of a collective sharing of ideas and strategies for adapting to the digital world. The challenges of digitization are complex and have far-reaching consequences. These challenges will require more work than was possible to undertake during the short mandate of the Task Force. The Task Force believes that the rewards of digitization are enormous and will benefit Canadians coast to coast to coast, as well as provide new opportunities for government. This report provides the Government of Canada with a framework for action that consolidates and prioritizes the recommendations from the five research areas into three phases.

The members of the Task Force urge the Government of Canada to maintain its momentum on digitization initiatives to ensure Canada's successful transition to a knowledge-based economy and society that reinforces Canada's cultural and social values.

B. ADDRESSING THE ISSUES

Introduction: Impetus for and Mandate of the Task Force

The Federal Task Force on Digitization was proposed by the ministers of Canadian Heritage and Industry in their May 1996 response to the Information Highway Advisory Council (IHAC) Phase 1 Final Report, *Connection, Community, Content* (1995). In its report, IHAC stressed the importance of Canada maintaining a strong presence on the Information Highway in both official languages and highlighted the opportunity for government to provide Canadian content by transforming its vast holdings of information, art, artifacts and scientific collections into digital form. IHAC emphasized that digitization not only affords Canadians greater access to government holdings and enables government to disseminate information in more cost-effective and innovative ways, but it also leads to economic development opportunities such as job creation.

The Task Force was established in April 1997 to propose mechanisms to ensure that federal institutions are able to distribute, electronically, sufficient Canadian content to promote federally held collections and information holdings. In addition, the Task Force was mandated to consider appropriate initiatives to stimulate economic development and explore measures needed to ensure the proper balance between tax-supported access and charging for access.

Digitization refers to the process of translating a piece of information, such as a book, sound recording, picture or video into bits. The availability of many types of federal information in digital form is increasing, particularly information about the ongoing operations of all federal institutions. Users of information, for example, can visit a federal department's Web site to get up-to-date information on its programs or to access its publications. Digitization also comprises the activity of converting retrospective collections held by the government, such as digital copies of paintings in the National Gallery of Canada, to be made accessible on the Internet or CD-ROM. While digitization often refers to the conversion of analogue materials, the project may include or be limited to the creation of a search tool or finding aid for users to easily access a collection of digitized or conventional materials.

As a communications vehicle, the Information Highway presents an opportunity for the Government of Canada to fulfill its responsibilities in the generation and dissemination of information in a more effective, efficient and timely manner. In addition, government production of off-line products, such as CD-ROMs, also supports government's role as a provider of information. Digitization does not change the government's responsibilities to provide information; it presents opportunities to fulfill those responsibilities in new and innovative ways. For example, members of a remote community can visit the National Museum of Science and Technology on-line without having to travel to Ottawa. At the same time, however, the digital environment presents new challenges that need to be addressed, such as the difficulty of keeping up with the accelerating pace of change of information technology.

To understand better the unique opportunities and challenges of digitization activities in the federal arena, the Task Force identified five research issues for further exploration. Five Advisory Groups were established to investigate the following key issues and make recommendations to the Task Force:

- *Issue 1:* Accessibility of Digitized Content
- *Issue 2:* Selection of Materials for Digitization
- *Issue 3:* Common Issues of Intellectual Property
- *Issue 4:* Identification of Standards and Best Practices
- *Issue 5:* Funding Strategies for Digital Conversion

In addition, the Task Force conducted a survey (Annex 2) of digitization activities, plans and priorities within federal institutions to determine more comprehensively the extent of their digitization activities. One hundred and ninety-four copies of the survey were mailed to chief information officers and senior-level information management persons representing 93 federal departments, agencies and Crown corporations. A total of 68 responses were received, representing a 73 percent response rate. The survey results provide an important foundation for the recommendations contained in this report, and form a preliminary baseline for future study.¹

The Task Force realized early in its exploration of the five research areas that the authorities and responsibilities for providing information by government departments, agencies or Crown corporations are the same in both the digital and non-digital worlds (see Figure 1). For example, government-published information, whether in digital or non-digital form, should be deposited with the National Library and made available to the Depository Services Program. Yet procedures for effective tracking and depositing of digital publications are not well developed and need to be strengthened. For example, digital and non-digital government records are transferred to the National Archives when the federal institution no longer uses them; however, the preservation of digital information is quite different from conventional practices. To ensure long-term access, research into preservation practices is needed.

Providing a framework for the digitization issues under study, Figure 1 illustrates that, in both the digital and non-digital worlds, what is crucial is an enabling environment that facilitates accessibility of information by users—whether they are citizens or consumers² or government itself. Such an environment will be made possible through strengthening and building upon the existing federal legislative, policy and operational framework. In addition, the creative potential of information technology can be harnessed to further enhance access to federal information, and at the same time fulfill the various government policy objectives.

¹ See Annex 2 for the Digitization Survey results.

² For the purposes of this report, a “citizen” is an individual who has a right to government information in order to participate in the democratic process, as well as for private study and research. “Consumers” are individuals or collectives who are users of federal information for a commercial interest or benefit.

Figure 1

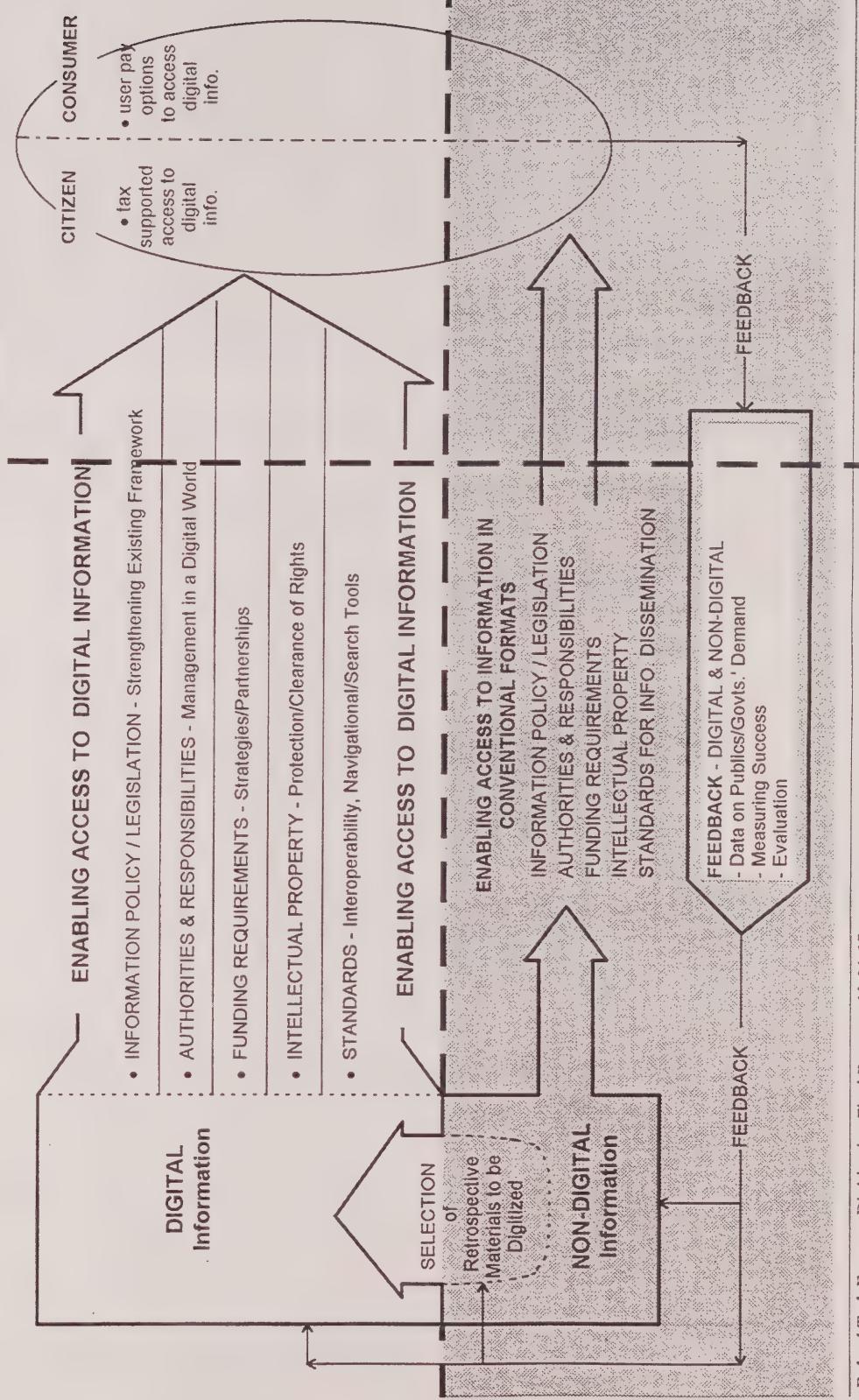
TOWARDS A LEARNING NATION: THE DIGITAL CONTRIBUTION

Federal Task Force on Digitization

FEDERAL GOVT.

(Federal Dep'ts., Agencies, & Crown Corps.)

USERS of Digital Information
 Publics: Citizens, Consumers, Private Sector, NGOs, Academia, etc.
 Govts.: Federal, Prov. and Terrs.



Overall, the intent of this report is to:

- provide an overview of current federal digitization activities (see Annex 2);
- increase awareness of the importance of providing digital access to federal content;
- identify the opportunities and challenges facing federal institutions engaged in digitization activities;
- propose mechanisms to increase availability of and access to federal information through digital means; and
- propose a three-phased approach for the development of a federal digitization strategy.

To focus the work for each of the five research areas, the Task Force set out to answer the following questions:

Issue 1: Accessibility of Digitized Content

How can the existing legislative, policy and operational framework be strengthened to enhance tax-supported and commercial access to Canadian digital content?

Issue 2: Selection of Materials for Digitization

What types of federally held collections and information holdings in analogue form should be selected for conversion into digital formats, and what guidelines could be helpful in this selection process?

Issue 3: Common Issues of Intellectual Property

How can the intellectual property rights of authors' works be protected in a digital environment, and in what ways can copyright management be made more efficient and effective to facilitate the clearance of rights?

Issue 4: Identification of Standards and Best Practices

What approach to information technology standards should the federal government adopt to promote interconnectivity among federal institutions and interoperability with users of digital information?

Issue 5: Funding Strategies for Digital Conversion

What funding strategies are possible for digitization projects in a climate of fiscal restraint?

The recommendations in this report support the Task Force's vision that advancements in information technology are a means to enhance access to the federally held cultural, economic and scientific collections and information holdings.

Grouped under the five issues, the proposed recommendations provide a strategic framework to facilitate effective and efficient creation, development and distribution of, and access to, electronic federal information holdings and collections. The recommendations promote the concept that the federal government should act as a *model user* and *catalyst* for the creation of, and the provision of access to, Canadian content on-line and off-line. In addition, the recommendations underscore the need for further review, research and communication to ensure maximum benefits from government-wide digitization projects.

As the Information Highway continues to evolve at an increasing pace, the federal government will need to position itself strategically to take advantage of the opportunities and address the challenges of the digital world. Never has there been a greater need to pursue a coordinated and integrated horizontal approach to federal communication and information dissemination responsibilities. Recognizing that Crown corporations, agencies and federal departments have differing mandates and legislative requirements, a cooperative, yet flexible approach to implementing the recommendations will accelerate and support the transition to a knowledge-based economy and society.

The response of federal departments, agencies and Crown corporations to the first draft of this report made it clear that the report has met its objectives of defining and clarifying issues and encouraging reflection, debate and action on their implications. While many comments have been reflected in this report, others will need to be addressed in Phase I of the implementation process. Repeatedly, federal institutions expressed their concern about the urgency of addressing the identified issues surrounding digitization, the need for immediate action, and the importance of maintaining the momentum created by the work of the Task Force.

This report represents an important starting point on the subject of digitization. With high-level Task Force representation from 21 federal institutions, it reflects the first collective discussions on this topic. These discussions have benefited from the experience and expertise of those federal institutions that have been and are actively making digital information available. But until recently they did not, to the same degree, have the benefit of a collective sharing of ideas and strategies for adapting to the digital world. The challenges of digitization are complex and have far-reaching consequences. These challenges will require more work than was possible to undertake during the short mandate of the Task Force. For a successful transition to a digital world, the Task Force recommends continued collective participation. The Task Force believes that the rewards of digitization are enormous and will benefit Canadians coast to coast to coast, as well as provide new opportunities for government.

This report contains a section for each of the five issue areas; each section provides an overview of the issue and the applicable recommendations. To further assist the government, the Task Force developed a framework for action that consolidates and prioritizes the recommendations from the five research areas into a three-phased approach, entitled "Steps to Success", which is presented in the Conclusion.

Issue 1: Accessibility of Digitized Content

Accessibility of federal government information holdings is important to Canada's future. Citizen access to federal information can promote national unity and social cohesion while mitigating regionalism and alienation. Access to information contributes to an environment that enables Canadians to be active participants in society in both official languages. Accessible information supports, among other things, formal education, lifelong learning, cultural dialogue and economic success both in Canada and globally.

Information and communications technologies offer invaluable opportunities to provide Canadians with the best possible access to digitized federal information holdings and collections. It is not surprising that the Task Force's survey indicates that while the objectives of digitization initiatives differ from organization to organization, the primary objective is to *improve access*. Other objectives include *cost savings*, followed by *preservation, keeping pace with technology, and information sharing*. When asked to identify the most significant challenges facing federal institutions in their planning and development of digital products,³ survey respondents most commonly reported *technical limitations*, followed by *budgetary constraints, copyright considerations, lack of policy guidelines* and, lastly, the *selection of materials for digitization*.

In providing digital products, the federal government must be aware that a significant proportion of the Canadian population does not have the technology or skills to access digital content. According to Statistics Canada, in 1997 an estimated 13 percent of Canadian households used the Internet from home computers. At the same time, the Task Force survey results reveal that, of 165 digital products described in the survey, 37 percent are provided in digital format only. (The remaining 63 percent are provided in conventional as well as digital forms.) Clearly, federal institutions will have to continue providing certain types of information in conventional formats, through existing channels, for the foreseeable future.

The application of information and communications technologies must not contribute to widening the gap between the information "haves" and "have nots". This concern is particularly relevant for disadvantaged or special-needs groups, including low-income earners, residents in rural and remote areas, persons with disabilities, and third-language users (e.g., Aboriginal language speakers). The capability and the inclination of Canadians to use digital media is another factor that merits consideration. Surveys continue to indicate that many people are not interested in using new technology ("The Information Highway and the Canadian Communication Household", October 1997, Ekos; "A Syndicated Public Opinion Review of Canada's Cultural Sector", 1997, Pollara). Whereas digitization can, in many cases, be a means of government cost saving and cost-recovery, citizen access to federal information should not be compromised.

³ Digital products, used interchangeably with digital projects, was referred to in the survey as: *a common grouping of digitized information, developed and/or acquired by a government organization for a specific purpose (e.g., a collection of literature or a collection of digitized holdings, excluding inter-office and administrative correspondence)*. The description of digitization used in this report is much broader (see the Introduction and Annex 6: Glossary).

Keeping in mind these considerations, the federal government must ensure that Canadians have the best possible access to federal digital information.⁴ Government has a role in providing information in support of the “public good”. The notion of the “public good” has been the subject of debate ever since it was introduced by early liberal philosophers like John Locke and Jean-Jacques Rousseau. Given that this is an evolving concept, the challenge for government is to identify, based on current public need, what types of information should be provided to Canadian citizens as a “public good”. The section of this report on Selection of Materials for Digitization provides “public good” criteria that may be applied immediately by federal institutions in their decisions to digitize material. However, given that society’s needs will change over time, more discussion and direction is required in this area. Furthermore, the digitization of all federal information would be prohibitively expensive; federal institutions may therefore be forced to categorize and then prioritize the various types of digital information that can be made available on a tax-supported or cost-recovery basis.

To make choices about what types of federal information holdings and collections should be made available and at what cost, it may be useful to categorize information as “essential”, “key” and “customized”. “Public good” would generally fall into the “essential” and “key” information categories.

- **Essential:** Federal institutions are required by legislation to provide this information on a tax-supported basis to citizens, in both official languages. This category includes information about dangers to health and public safety as well as citizen rights, entitlements and obligations. This body of information is constantly evolving and requires continual reassessment on a case-by-case basis, in terms of meeting the principles of open government and public benefit.

Examples: **Federal election results** must be printed as per the *Canada Elections Act* and are available without charge to the user in both print and digital formats.

Federal budget speeches must be printed as per the House of Commons’ mandate and are available without charge to the user in both print and digital formats.

- **Key:** Federal institutions do not have an explicit statutory obligation to provide this information, but it is nevertheless vital for the future of Canada and its citizens. This includes information that helps to promote the health of Canadians, to promote economic opportunity, to promote Canada’s linguistic duality, to invigorate the cultural dialogue that defines national identity and the diversity of Canadian society, and to sustain social cohesion. Federal institutions should determine their duty to provide such information within the context of their specific mandates. Key information should be provided free or at marginal cost-recovery.

Examples: **Attestation Papers (enlistment documents) from the First World War Canadian Expeditionary Force.** Twenty percent of the 600,000-plus records held in the National Archives (NA)

⁴ Whereas this report is concerned largely with issues related to the content of federal information, the federal government is attempting to ensure through other initiatives that all Canadians have access to information technology hardware (e.g., Community Access Points).

are digitally available at the NA and SchoolNet Digital Collections Web site free of charge.

Tobacco On-line is a Health Canada service provided free of charge to help Canadians become and remain smoke-free. This information is currently available in digital format and is supplemented by print pamphlets free of charge to the user.

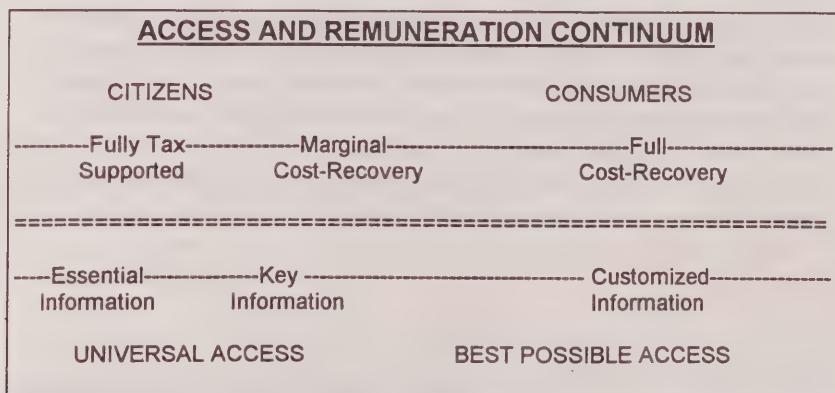
Canadian Technology Network, developed by the National Research Council in partnership with Industry Canada, provides information to meet technology and related business needs. This information is available in digital format only, free of charge to the user.

- **Customized:** This refers to the type of information that benefits an individual or a firm. It can be used for commercial purposes, and its individual users are viewed primarily as consumers (as distinct from their role as citizens). Federal institutions would provide customized information at market value. However, its availability cannot be guaranteed by the federal government since it would be based on demand and what the market is willing to bear.

Examples: **Statistics Canada** packages raw data according to the needs of the user and charges a fee for both print and digital formats.

Atmospheric Environment Service, Environment Canada, provides customized weather information and charges a fee for both print and digital formats.

Using these information categories, the proposed "Access and Remuneration Continuum" (see below) provides an adaptable framework for making choices and tradeoffs when making information accessible to the Canadian public on a tax-supported or commercial basis. The Continuum is conceived not as a rigid model, but as a general and flexible approach that individual federal institutions can utilize according to their own mandates. Further, it is recognized that while some institutions have the obligation to disseminate information to the public, others do not have this obligation. Nonetheless, in the interests of lifelong learning and the promotion of social cohesion, federal institutions should strive to provide as much information as possible on a tax-supported basis to citizens.



By undertaking certain legislative and policy⁵ initiatives, government would be in a better position to seize information technology opportunities that can further enhance access to digital information for Canadians. To this end, the following recommendations are proposed.

Legislative and Policy Initiatives

Today's enormous strides in information technology have profound implications for communications and dissemination of information. Consequently, there is a need for more planning, organization and coordination both at the institutional level and horizontally across government. For example, of the federal institutions responding to the Task Force survey, only 29 percent reported having a policy for their digitization activities. Of the 71 percent of survey respondents who reported that they did not have a digitization policy, one-half indicated that they were in the process of developing one.

It has become necessary to strengthen and build upon federal information legislation and policies to reflect the realities of a digital environment. Rationalization of legislation and policies will reinforce the information components of the mandates of all federal institutions. Overlap and duplication in information dissemination can also be minimized. From the public's perspective, a coordinated and integrated approach to federal information legislation and policies will improve access to all types of information. Therefore, in order for Canada to play an enhanced role in the digital environment:

1.1 The federal government should develop a Federal Information Policy that would provide the basis to rationalize information policies into one comprehensive framework. While the rationalization process would include many components, the following should be considered:

- a. Ensuring that existing federal information legislation and policies are "technology neutral",⁶ where possible, or strengthened to reflect the new realities of a digital environment.**

Examples include strengthening the roles of the National Library Act and the National Archives Act in acquiring, organizing, preserving and ensuring access to government information in a digital environment. Another key component of such an initiative would address the special circumstances relating to personal information and privacy in a digital environment by clearly identifying the types of information covered by "personal information and privacy", and outlining the potential issues and the attendant privacy risks or implications.

⁵ Annex 3 provides a quick reference to federal information legislation and policy relevant to this topic.

⁶ Technology neutral means not favouring one technology over another (as described in the Information Highway Advisory Council's final report, *Preparing Canada for a Digital World*, September 1997, p. 13).

- b. Developing federal information policies identifying and describing types of information, such as “essential”, “key” and “customized” information, based on the proposed Access and Remuneration Continuum.
- c. Ensuring that published digital information is deposited with the National Library of Canada to strengthen its role in acquiring and preserving a comprehensive collection of published Canadiana.

Since its creation in 1953, the National Library of Canada has as its fundamental role the acquisition and preservation of all types of Canadian publications. The legal deposit provisions of the National Library Act have been systematically extended to new formats of publishing, including media such as CD-ROMs. However, a number of federal on-line publications are not being acquired and maintained comprehensively because it is difficult to track them in a systematic manner.

- d. Expanding the Depository Services Program (DSP) to include published information in digitized format.

As the public information safety net, the DSP undertakes to identify publications in all formats released by the federal government, to negotiate and implement arrangements to make them accessible in a manner and quantity consistent with the depository institution’s network needs, to make the publications available, and to represent the network’s requirements to federal departments and their publishers. Increasingly, however, government publications are being made available in digital format only. Identifying and depositing these electronic materials is often problematic. The role of the DSP must be strengthened to ease the transition to the digital environment.

- e. Ensuring that federal institutions continue to publish “essential” and “key” information in conventional and alternative formats for the benefit of Canadians who do not have access to and the knowledge to use information technology.

Influenced by the need to limit the costs of government services, some federal institutions may be compelled to stop providing information in conventional formats. There may be cases where some institutions, having a technologically sophisticated clientele, will move rapidly to provide the majority of their information solely in digital form. Such choices, however, should be made only after careful study and analysis of the impact on their target user populations. These institutions should also endeavour to provide access that meets the needs of members of the public who are not considered part of the target client base.

It is also important to keep in mind that the adoption and penetration rates of communications technologies have limits. In 1995, the penetration rate for the telephone was 98.8 percent of Canadian households; the rate for cable television was 73.4 percent (Paul T. Dickinson, Access to the Information

Highway: Canadian Households, *Report prepared for Industry Canada, Spring 1996*). These rates have reached a plateau over the past few years and are not expected to change significantly. Experts from the communications industry believe that the penetration rate for information technology will similarly plateau, but at a lower level. For the foreseeable future, therefore, providing only digital information would decrease access to "essential" and "key" information for a significant number of Canadians.

- f. Ensuring that federal institutions adopt information dissemination technology (hardware and software) that does not impede access for citizens and institutional users to "essential" and "key" information.

While new and emerging technologies allow digital information to be presented in innovative ways, the majority of potential users are unlikely to have access to sophisticated hardware and software. Sharing of information among federal institutions, as well, is often impeded by the use of incompatible software and information technology standards.

- g. Seeking partnerships with the private sector, where appropriate, to encourage the creation and provision of "key" and "customized" digital information that meets user needs.

For example, a CD-ROM product entitled Canadian Geographic Explorer is a multimedia interactive journey around Canada featuring an in-flight simulator, astronaut videos and narrations, the world's first 3D satellite images, more than 500,000 map combinations, photos and video clips, and a Canadian Geographic archive. To provide Canadian students with the highest-quality learning resource and to offset the cost of CD-ROM production, IQ Media worked with several agencies from the public and private sector who contributed their expertise, information, imagery, distribution capacity, etc.: the Canadian Space Agency, Natural Resources Canada, the National Film Board of Canada, Canadian Geographic, Sierra, RadarSat International, QuickTime and PCI.

The Decade of the Arrow is another example of a successful partnership. The National Aviation Museum (a component museum of the National Museum of Science and Technology Corporation), in cooperation with Digital Renaissance, has prepared a multimedia database on the Avro Arrow, a supersonic aircraft developed by A.V. Roe Canada in the 1950s. Steve Shaw Productions produced the video components, and the CBC Archives and the Department of National Defence Archives provided archival footage. The Avro database is made accessible through Bell Canada's experimental high-speed network subscription service, which allows subscribers to receive multimedia information, broadcasts and community services on their personal computers or on a network computer hooked to their television set. The service is currently available in Repentigny, Quebec, and London, Ontario, and will soon be accessible at the National Aviation Museum in Ottawa.

h. Ensuring that any charges for government digital information are fair and equitable.

There are growing pressures on federal institutions to charge fees for access to or use of federal information holdings or collections, including those in digital form. Determining the fair and appropriate price or user fee for digital information raises many new issues that go beyond the conventional means of information dissemination. For example, would information available on-line be charged at a different rate than its paper equivalent? To address such questions, policies such as Treasury Board's Cost-Recovery and Charging Policy could be strengthened to provide support to and guidance for the setting of fair and reasonable fees for digital information. In addition, government information in electronic formats is increasingly being made available for sale to the public through licensing arrangements with the private sector. Agencies such as Canadian Government Publishing, Public Works and Government Services Canada, as well as some departments and sectors with expertise in licensing, co-publishing and Crown copyright administration, will have much to contribute to the examination of fair and equitable charges and licensing arrangements for digital information.

By building on existing policies and practices, the following should be pursued:

- i. **Policy guidelines should be developed for licensing the commercial use of federal digital information so as not to impede public access. Where partnerships with the private sector are concerned, preference should be given to non-exclusive licensing arrangements, except in cases where access can be demonstrably enhanced through exclusive arrangements.**

For example, Treasury Board's Primer on Databases for Managers states that licensing is considered a useful way to place information where it can be conveniently accessed and used by the public. It also suggests that granting exclusive licences should be avoided, as this practice may decrease access to information. Consequently, non-exclusive licences are preferred.

- ii. **The commercial use of federal digital information through collaborative arrangements with the Canadian private sector (e.g., private sector partnerships and non-exclusive licensing agreements) should be facilitated; and**
- iii. **A means of redress should be provided for members of the public, should they believe they are not getting access to digital information due to unfair charging practices.**

The current means of redress available through Treasury Board's Cost-Recovery and Charging Policy is inadequate and must be

strengthened. One means of strengthening it would be to broaden the mandate of existing agencies, such as the Office of the Information Commissioner and the National Library of Canada, to include a means of redress for individuals who believe they are not getting access to published information in digital form because of unfair charging practices.

- i. Ensuring that access to federal information holdings is an integral part of the National Access Strategy referred to in *Building the Information Society: Moving Canada into the 21st Century*. The ministers of Industry and Canadian Heritage are responsible for developing a National Access Strategy involving policy, regulatory and other measures to ensure affordable access by all Canadians to essential communications services. Support would include:
 - i. providing, where appropriate, access points on the premises of federal institutions for citizens to gain access to “essential” and “key” information; and
 - ii. pursuing and enhancing partnerships with non-federal organizations to create access points to federal digitized information throughout Canada.
- j. Developing a mechanism to monitor and evaluate the performance of federal institutions in providing access to information in both non-digital and digital forms.

- 1.2 The federal government should promote government-wide initiatives that would identify, locate and allow for a single-window access to federal information holdings in a digital format (e.g., Government Information Locator Service [GILS]). This initiative would be complementary to Recommendations 3.1 under Common Issues of Intellectual Property and 4.1 to 4.2 under Identification of Standards and Best Practices.

As digitized content becomes more available and replaces printed material, sorting and accessing the desired information becomes increasingly complex. The current proliferation of information sources, identification tools and acquisition methods remains a deterrent to effective and efficient access to Canadian content for the majority of Canadians. Therefore, it is important to build on existing core government communications initiatives such as GILS.

As a mechanism for identifying and describing government information resources, GILS assists the public in accessing government information. The Treasury Board Secretariat and the interdepartmental GILS Subgroup are coordinating a GILS Pilot Project within the federal government to determine if the GILS record is sufficient to describe and provide access to government information resources; to evaluate the GILS record creation tool and central GILS record repository; and to help departments and agencies identify

requirements for creating, maintaining and updating GILS records. The Preliminary Report of the Canadian GILS Subgroup and GILS Pilot Project, February 1997, is available at the GILS Web site.

1.3 Advancements in information technology present opportunities to enhance access for all Canadians to federal information holdings. This is particularly important for disadvantaged or special-needs groups, including low-income earners, residents in rural and remote areas, persons with disabilities, and third-language users (e.g., Aboriginal language speakers). To enhance access the federal government should:

- a. undertake studies to determine the needs of disadvantaged and special-needs segments of the population;
- b. develop guidelines for providing digital information that has been adapted to suit different subsets of the intended audience (disadvantaged and special needs). Success stories of digitization in meeting special needs should be recognized through appropriate incentives.

In terms of meeting special needs for accessing information, conventional communication methods have tended to be relatively limited. In general, any new technology providing an interface to information resources is liable to present challenges to disadvantaged or special-needs groups. Often, access for these groups is not considered during the content design phase of projects. It is imperative, therefore, to consider the needs of these groups in the dissemination of digital information.

The Diversity Management Directorate (DMD) of the Public Service Commission of Canada provides Web Site Self-Evaluation tools as a practical guide to help Web site designers ensure that sites are accessible—for example, to people with disabilities such as blindness.

1.4 The federal government should develop a system of authentication for digitized Canadian government information to ensure that users are accessing authentic information. This initiative is complementary to Recommendation 3.1 (c) under Common Issues of Intellectual Property.

Users of information are concerned with the authenticity and quality of on-line information. It may be useful for certain federal institutions to develop systems of authentication relating to government information in their specific areas. For example, information technology allows digital signatures to be attached to documents. These digital signatures enable users to be confident that the information they have accessed is an authentic and unmodified expression of its author.

1.5 The federal government should strengthen the technical infrastructure required by the National Library of Canada and the National Archives of Canada to ensure preservation of and long-term access to federal digital

information. In addition to strengthening the technical infrastructure, it will be important to develop guidelines and strategies to assist federal institutions in fulfilling the legal requirements for supporting the mandate of the National Library and the National Archives in recognition of the new parameters of the digital environment.

The National Library and the National Archives have a mandate to acquire, make accessible and preserve electronic publications and records for current access and for the use of future generations. Further development of technical infrastructure is required for the National Library and the National Archives to support electronic document management, electronic storage, and searching and preservation of the range of federal information in electronic formats from all departments and agencies. Development tools and platforms are required to permit the Library and the Archives to support applications needed to ensure long-term accessibility and preservation of a comprehensive and technically diverse collection of electronic publications and records. The infrastructure must provide a solid technical foundation and must be flexible enough to both allow enhancement in a rapidly evolving technical environment and to accommodate dramatically escalating growth.

Issue 2: Selection of Materials for Digitization

Federal government departments, agencies and Crown corporations have vast collections and information holdings, much of them not yet in digital form. Digitization of these collections offers a unique opportunity to make them available to Canadians across the country. Given the current fiscal reality, it is not possible to digitize all the retrospective collections and information holdings that have been collected and generated by government over the years. Materials to be digitized must be selected and prioritized in a judicious manner, and be easily accessible to the user.

Digitization projects, therefore, may also include the provision of search tools and finding aids, including databases, for the user to easily access a collection of digitized items or conventional materials. They may also provide a valuable service in cataloguing or publicizing information.

Before embarking on developing criteria for the selection of materials for digitization, the Task Force realized that it was necessary to take stock of current federal digitization activities. Lacking data on the nature and extent of current digitization activities within federal organizations, the Task Force undertook a survey of federal departments, agencies and Crown corporations. Responses indicated that the primary reason for selecting materials to be digitized was to fulfill the *mandate to communicate widely*. Other reasons included *research significance*, followed by *educational significance, outreach* and, finally, the *promotion of social and cultural equality*. These findings suggest that most digitization activity is being undertaken to meet program objectives. Digitization activities that go beyond program objectives, primarily to reach broader audiences, may require additional funding beyond institutions' existing allocations.

Respondents indicated that for the 165 digital products reported in the survey, the main intended audience is the *general public*. The *federal government* was the second most cited intended audience, followed by *educational organizations*, the *private sector*, *provincial governments*, *international governments* and, lastly, *specific audiences*. The purpose for the creation of digital products varied, but *general public interest* was most often cited. Other commonly identified purposes were *preservation*, followed by *revenue generation* and *exhibition*.

Providing useful and timely information for users begins with knowing who the user populations are and how they are accessing and using federal materials. Federal institutions know their key client groups and continually monitor and adapt to client needs.

Selecting Materials to Be Digitized

Digitization projects based on federally held collections and information holdings and supported by dedicated funding should:

- support lifelong education and learning
- reinforce a shared national consciousness and informed citizenship
- be linked to economic growth and job creation

Decisions to select materials for digitization should also be based on a business-like approach that:

- identifies target user populations
- understands the needs and expectations of the users
- identifies measurable deliverables that will demonstrate benefits
- includes a promotion/marketing plan
- provides itemized costing
- takes into account the work necessary for obtaining copyright clearance for the material to be digitized

However, the needs of the broader user community are not well known. As more departments begin packaging information for schools and the general public, it is increasingly important to understand these needs.

Few models for measuring the cost effectiveness and/or success of digitization projects exist to guide government in the selection of materials for digitization. Less than half of the survey respondents reported having conducted a policy review or program evaluation to assess the effectiveness of their digitization projects. Yet evaluation and review are essential to measure success and should be provided for in any digitization proposal.

Long-term maintenance of digitized information demands significant financial and human resources, which must be accounted for in the planning stage. The majority of digitization products (66 percent) identified in the survey require continual maintenance (updates) for an indefinite period of time. This means providing for the cost of migrating to new technology over time. The survey indicated that the human resource complement of digitization activities, measured in terms of full-time equivalents (FTEs), varied significantly from institution to institution. Given the high percentage of "incomplete" responses on the subject of costs, further study will be required.

The level of technology available to user groups for accessing and making effective use of digitized material must be considered when selecting materials for digitization. If the user does not have access to the technology to view large graphic files such as art works, photo images and maps, the dissemination of digitized material will be impeded.

On the other hand, the public may develop expectations about digital access to federal holdings that cannot be met. It is important to manage expectations and meet user needs as much as possible within the resources available and according to established priorities.

Having said that a business-like approach is needed to justify investment in digitization, the Task Force would add that dedicated funding should be set aside, particularly to digitize retrospective materials, as recommended in Recommendation 5.9 under Funding Strategies. If Canada's rich history and heritage, and the wealth of economic and scientific information in the archives of federal institutions, are to reach current and future generations of Canadians, digitizing Canada's retrospective information holdings and collections is crucial.

The following "public good" criteria and proposal methodology are recommended for accessing a central fund dedicated to digitization projects. The underlying assumption is that many digitization projects whose primary justification is the "public good" will have minimal chance of recovering costs through savings and/or fees. Therefore, these projects should be financed through the dedicated fund if they can demonstrate a real contribution to achieving the "public good" goals of the federal government and are supported by a sound business-like approach.

Digitization Proposals Contributing to the "Public Good"

The suggested criteria for the "public good" are consistent with the categories of "essential" and "key" information proposed in the previous section on Accessibility of

Digitized Content. The concept of the “public good” is dynamic and evolving, and is interpreted according to the needs and priorities of Canadian society. The following criteria reflect the current understanding of the “public good”.

2.1 The overall concept of “public good” can be extended beyond the duty to inform (health, safety, security, consumer protection) to include additional criteria that could assist in the decision-making process for approving digitization projects that seek access to dedicated funding. The following criteria, not listed in order of priority, should be adopted:

- a. Digitization projects supporting *education and learning* can help create broader and richer collections of digital information and search tools that encourage and support learning for all ages and life stages. Technology also provides the opportunity to develop new and innovative multimedia educational tools that allow for the interactive presentation of educational materials. In developing educational materials, priority should be placed on supporting provincial, territorial and First Nations’ educational goals, on reflecting Canada’s linguistic duality, and on meeting identified learning needs.

SchoolNet could perform a brokerage role to ensure that federal institutions, in collaboration with provincial, territorial and First Nations educational authorities, provide material and search tools to support educational goals.

b. Digitization can contribute to a *shared national consciousness and informed citizenship*. Therefore:

- i. materials about the Canadian experience should take priority over materials about foreign experience in digitization projects. However, the attempt to define “Canadian” material through a system of rules can be counterproductive;
- ii. French-language digital content available on-line and off-line should be increased. Currently, there is insufficient availability of French digital content, even though federal institutions, fulfilling their obligations under the *Official Languages Act*, provide information and services to the public in English and French;
- iii. while the provision of materials in the two official languages is essential, the use of other languages should be encouraged where appropriate; and
- iv. an attempt should be made to provide material that is representative of the different regions and cultures of Canada.

c. Digitization projects can support *economic growth and job creation*.

Therefore:

- i. the federal government should support digitization projects that contribute to the economic growth of the country. Digitization projects have the potential to support innovation, sustainable development, regional development, a skilled work force, global opportunities and a knowledge-based economy.

In particular, the federal government should support interdepartmental and national digitization projects that contribute to the sharing of information and expertise in support of informed economic decision-making and increased competitiveness for Canadian industry and business;

Examples include initiatives such as Industry Canada's on-line business information source, Strategis, and the Department of Natural Resources-led Canadian Geospatial Data Infrastructure, a national electronic network that will expedite the collection and dissemination of geographic information, including natural resources, environmental, social and economic data.

- ii. the digitization of federal materials, and to some extent digital content development, could be offered as contract or employment opportunities to Canadian companies or to groups identified under federal job creation initiatives. These opportunities could be targeted to small and medium-sized enterprises (SMEs) such as youth-run firms.

For example, Industry Canada's SchoolNet Digital Collections program has provided short-term jobs for more than 900 young Canadians and has supported the launch and expansion of a number of multimedia firms across Canada since May 1996.

Demand for Digitized Material

2.2 The federal government should review existing studies and sponsor additional research into the costs and benefits of providing information through digital means to the general population and target user groups. This research would contribute to a better understanding of the user populations in general and how they access and use federal information in particular. In undertaking the additional research, the government should select for objective impact studies digitization projects representing the cultural, social, economic and scientific portfolios. It is suggested that:

- a. studies be used to establish cost/benefit models;

- b. representative projects be linked to known uses of information, such as use for educational purposes; and
- c. the studies conform to all applicable federal policies and best practices.

Digitization Proposals

2.3 Proposed digitization projects of federal departments, agencies and Crown corporations, including those for which dedicated funding is sought, should be supported by a detailed analysis and plan using a business-case approach.

a. Each proposal must:

- i. identify the target user population;
- ii. clarify the needs and expectations of that population with respect to the project;
- iii. identify the objectives of the project and establish measurable deliverables that demonstrate the benefits;
- iv. contain a marketing/promotion plan to ensure awareness of the project;
- v. provide itemized cost figures for all components of the project; and
- vi. identify and resolve any access restrictions and copyright considerations applying to the material to be disseminated.

b. Each proposal should:

- i. include provision for search tools and finding aids for the collection being digitized;

The provision of tools to enable users to access information is as important as the provision of digital materials. In some cases, a viable project could involve simply creating the digital finding tools for public access to a collection that is only available in conventional format.

- ii. make use of standards and best practices to support technical and search accessibility;
- iii. contain a user feedback component, as appropriate. Where possible, proposals with common user bases should be grouped together for ease of surveying and evaluation; and

iv. where possible, provide a “demo” to enable preliminary evaluation of the project’s usefulness and ease of use.

2.4 The government should generally not digitize information that is available digitally elsewhere, but may provide a valuable service in cataloguing, publicizing or in some cases validating material disseminated by others.

For example, Health Canada (HC) has plans for a National Population Health Clearinghouse that will consolidate health promotion, disease prevention and risk management information relating to a range of health issues and life stages. The Clearinghouse will provide one-window access to expertise and knowledge found in HC, other federal agencies, provinces and territories, non-government organizations, universities and the private sector. The intent is not for the federal government to digitize all its health information but to include referrals and links to local or provincial organizations as appropriate.

Another example is the National Library of Canada’s service, Canadian Information by Subject, available at the Library’s Web site. The objective of this service is to provide links to information about Canada, arranged by subject, from Internet resources around the world. The service is updated regularly and is constantly developing and expanding.

2.5 Interdepartmental partnering on digitization projects should be encouraged because it will build on the existing strengths of departments and ensure complementarity and the sharing of resources.

Preservation

2.6 In the selection of materials for digitization it is recommended that digitization be viewed primarily as a dissemination initiative rather than a preservation initiative. The National Archives of Canada and the National Library of Canada should, according to their respective legislative mandates, continue to develop policies, procedures and guidelines for the preservation of digital materials and make these available to other federal institutions. This recommendation is complementary to Recommendation 4.6 under Identification of Standards and Best Practices.

Digitization should not be seen as the solution to problems of preservation. While in some cases it has a role to play in providing copies for use in order to prevent wear on originals, the archival and library community does not feel that digitization is the answer for long-term preservation. A push towards digitization should not obscure the need for the continuance of existing preservation, archiving and collection activities.

Digital information is less stable than analogue and fixed-media materials, in large part because of the rapidly changing nature of digital formats and of the software and hardware required to read digital images. The rapid pace of change creates a need to provide continuing resources for the migration of data

to other formats. Researching preservation standards and best practices, as proposed in Recommendation 4.6 under Standards and Best Practices, will assist departments in maintaining and preserving their digital resources until such time as they are transferred to the National Library or the National Archives.

The Information Highway presents an opportunity for federal institutions to make available, in digital form, information they have generated or gathered as well as materials in their cultural and scientific collections. Providing access to such information and materials in a digital format will enhance the Canadian presence on the Information Highway and will also provide opportunities to stimulate the development of Canadian content industries. It must be recognized, however, that the ability of federal institutions to use certain materials is subject to the authorization of third parties. For example, if the government does not own copyright in the material, it must seek the copyright owner's permission.

The federal government should be a *model user* of the Information Highway and a *catalyst* for the creation of and the provision of access to Canadian content.

This section deals with rights set out in the *Copyright Act*. Other types of intellectual property protection such as patents, trademarks, etc., may be relevant in certain situations, but given its time constraints, the Task Force found it necessary to focus on the most important issues.

Copyright protection is critical to ensuring that rights holders benefit from their effort and investment through recognition and remuneration. It establishes the incentives that creators need to encourage them to make their works available. Without copyright protection, access to content would be seriously hampered. By the same token, the government, in addressing the challenges of the digital era, must be mindful of the practical needs of users who wish to access the works that benefit from this protection.

The rights set out in the *Copyright Act* provide the same protection to works in digital format as to works in any other format; the same rules apply both on and off the Information Highway. While the Information Highway presents tremendous opportunities for disseminating information widely, it also increases the difficulties involved in managing and protecting rights. Knowing that the potential for unauthorized use and widespread piracy is high, rights holders may be reluctant to make works available.

In addressing the reluctance of creators, it must be recognized that the copyright infringement that occurs today is carried out not only by unscrupulous profiteers; a considerable amount is carried out on a more pedestrian level by people who are simply unaware of the implications of their actions.

Furthermore, the international nature of the Information Highway adds to these difficulties. At present, the international intellectual property agreements to which Canada

The Copyright Act

The Canadian *Copyright Act* sets out a number of rights that cover a wide variety of works and their uses. These rights arise automatically on the act of creation; there is no need for a creator to register his or her work to benefit from copyright protection. In most cases, the rights vest with the creator of the work. However, they may be assigned to third parties, including societies that have been created to administer rights. The right to reproduce a work (e.g., digitizing a work) and the right to communicate a work to the public by telecommunication (e.g., making a work accessible over the Internet) are the most significant copyrights in a digital environment.

is now or may become a signatory do not address all of the challenges presented by the Information Highway.

The Task Force sees the challenges that will be encountered in the digital universe—by rights holders and users alike—as falling generally under four headings:

1. Determination of copyright interests:

- Is the material to be used protected by copyright?
- If so, what rights are involved in carrying out the intended uses?
- Have the relevant rights already been acquired or have licences already been obtained?
- If not, who owns the rights?

2. Clearance of rights:

- How can the rights holders in a given work be located?
- How is the use of a work to be valued, if licensing is required?
- What clearance mechanisms are in place to clear the rights involved (e.g., a central clearing mechanism or private negotiations with the rights holders)?
- How can copyright management be made more efficient and effective to facilitate the clearance of rights?

3. Protection of rights:

- What can be done to ensure that third parties are made aware that a particular work is protected by copyright?
- What types of technological measures (e.g., encryption, watermarking, digital signatures, copyright management information) would best assist protection and ease the management of rights?
- How can the rights in a work be protected using existing legal means (e.g., through copyright law, contractually)?
- What additional legal measures (e.g., model licensing agreements, new legislative measures, international treaties) should be adopted to better protect rights in the digital environment?

4. Lack of copyright awareness:

- How can awareness of copyright be raised both within and outside the government?

The proposed recommendations are premised on the principle that the government acts and will continue to act in a model fashion. Acting “in a model fashion” requires government to exhibit transparency and fairness in its dealings with rights holders and users involved in digitization initiatives. Whenever the government must negotiate or consult with these parties, it should strive to create a climate of trust and openness. For instance, licences concluded by the government in respect of copyright material should be very clear in specifying permissible uses.

On a practical level, the government should strive to adopt practices that are meaningful to rights holders and users outside of the government, that could be emulated or would at least be responsive to their practical concerns.

To this end, and with a view to meeting the challenges that have been identified, the following recommendations are made:

Government Policy and Guidelines in Respect of Copyright

It was evident that the most appropriate means to facilitate the determination and clearance of rights, and address issues surrounding the protection of rights, would be some form of federal administrative policy and guidelines. While not all federal institutions would be covered, the policy and guidelines could serve as the basis for any internal policies and practices that they might wish to develop.

A distinction must be drawn between ownership of a work and ownership of copyright in the work. For example, although a heritage institution may own and, therefore, control access to a painting, it may not have the right to license uses of the painting that are protected by copyright.

3.1 The government should develop an administrative policy and guidelines for dealing with copyright in a digital environment. The policy and guidelines would be flexible, but would set out the following:

a. The government as owner of copyright:

At this time, the administration of government-owned copyright is not wholly centralized. While the licensing of some published government works is administered through Public Works and Government Services Canada (PWGSC), a number of agencies and Crown corporations have the authority to administer their own copyright licensing regimes. In this situation, users of works often find it difficult to identify the government entity that has legal control over particular works, or the person or office within those entities that can legally authorize use. By the same token, government departments and agencies are often unsure about how to establish the conditions under which licences should be granted.

Accordingly, with respect to use of government works, the policy and guidelines should:

- i. adopt a “single window” approach for streamlining rights licensing.**

The “single window” should be versatile, adapting itself to the realities of individual departments or agencies. In some cases, it could help departments or agencies to establish whether and at what level they should charge royalties to users. In other cases, departments and agencies could authorize

the “window” to issue licences directly to users on their behalf on the basis of a fixed tariff. At the very least, it could serve as an information centre that refers users to the authority, agency or department that has the ability to issue a licence.

b. Copyright not owned by or licensed to the government:

Copyright in much of the material in the federal heritage collections continues to be owned by private parties.

The policy and guidelines should therefore:

- i. affirm the general rule that, in accordance with law, federal institutions will clear the rights needed to use the works;
- ii. affirm that federal institutions will inform users of their responsibilities regarding copyright and, where appropriate, will take reasonable steps to ensure that users obtain the clearances they require before using federally held materials for digital projects;
- iii. encourage the recording of copyright management information to facilitate the clearance of copyright.

c. Copyright protection:

New technologies such as watermarking, encryption, and electronic copyright management information enhance a copyright owner’s ability to discourage the unauthorized use and dissemination of his or her work. The government, as a digitizer of works, should consider the use of these technologies, as appropriate, to facilitate the protection of rights and, thus, to reassure the copyright owner.

Accordingly, the policy and guidelines should include:

- i. criteria for determining when encryption would be beneficial or required;
- ii. standards for the presentation of copyright management information (e.g., copyright notices and other identifiers);
- iii. standards for the technological measures that could be used to protect works and copyright management information.

It is recognized that, currently, the technologies for encryption, watermarking, and copyright management information are evolving rapidly and will perhaps require considerable refinement before they offer the most effective means to copyright protection. The government should nonetheless

implement the best technologies currently available, but should also continue to monitor technological developments with a view to continually improving its practices.

Model Licences

3.2 The government, in its role as a model user and catalyst, should study the feasibility of developing model licences for the use of copyright-protected works in a digital environment. These licences could be developed in consultation with interested parties and would:

- a. cover government as both a user and a rights holder;**
- b. be clear and fair;**
- c. specify permissible uses and restrictions;**
- d. strike a mutually beneficial balance between the interests of creators and users;**
- e. address the possibility of downstream licensing.**

Licences drafted according to these principles could encourage creators to license use of their works to the government and might also serve as models for use by the private sector. These agreements should be implemented consistently across government.

Legislative Measures

In Building the Information Society: Moving Canada into the 21st Century, the federal government indicated that “the Ministers of Industry and Canadian Heritage will work closely with stakeholders to resolve outstanding copyright issues related to the Information Highway and reach a determination as to whether there is a need to revise the present Act further”.

The Federal Task Force on Digitization acknowledges that this effort represents an important element of the government’s digitization initiatives and encourages the government in this undertaking. Accordingly:

3.3 The government should continue to resolve outstanding copyright issues related to the Information Highway in consultation with stakeholders.

The Task Force notes that the government has recognized the need for “more efficient enforcement and administration measures to ensure efficient copyright protection in order to respond to creators’ legitimate fears about pirating and unauthorized reproduction of works”. With this in mind:

3.4 The government should ensure that the *Copyright Act* provides adequate sanctions against unlawful tampering or bypassing of any kind of encryption, copyguard or copyright management information.

In this respect, the Task Force also notes that there is currently much discussion in international forums concerning the desirability of providing adequate legal remedies against persons who knowingly remove or alter any electronic rights management information without authority or who deal in works knowing that electronic rights management information has been removed or altered without authority.

The government's collections also include information holdings, such as databases, that may not benefit from copyright protection, but that nonetheless represent an important asset. Therefore:

3.5 The government should consider whether some form of protection against unauthorized use of information holdings such as databases is required.

International Measures

Because of the transnational character of the Information Highway, the effectiveness of domestic measures designed to protect copyright will depend, to a great degree, on the willingness of foreign jurisdictions to acknowledge and deal with challenges to copyright. Accordingly:

3.6 The federal government should continue to participate in negotiations being conducted in international forums such as the World Intellectual Property Organization, the World Trade Organization and other organizations dedicated to developing multilateral and regional trade agreements, to develop harmonized approaches to dealing with these issues.

Copyright Awareness

The work of IHAC's subcommittee on copyright suggests that many people, including both creators and users, are unclear as to whether and how copyright protection applies in the digital environment. This has an important impact on the development and success of any initiatives for the management of rights in that environment. Accordingly:

3.7 The government should strengthen existing programs and create new programs for encouraging awareness of copyright, both within and outside the government.

The current vision for the Information Highway is characterized by a multitude of interconnected networks, services and applications. Constant and unpredictable technological change, coupled with a staggering number of new and proposed standards and an increase in the number of stakeholders in the standards and user communities, have created something of a standards crisis in the informatics community. Given the plethora to choose from, it is difficult to determine which are the "best" standards.⁷

For each type of the 165 digital products identified in the Task Force's survey there were some widely used information technology standards, as well as a significant diversity of "other" responses. The following findings are representative of the proliferation of standards and highlight the difficulty in determining what would be considered a best current practice.

Text-Based Languages Used

- .html (49%); .pdf (18%); .txt (16%); and others (17%).

Image-Based Languages Used

- .gif (32%); .tif (26%); .jpg (25%); and others (17%).

Sound-Based Products Used

- .wav (41%); .ra (19%); .au (9%); .aiff (6%); .mid (6%); and others (19%).

Multimedia-Based Languages Used

- .mpeg (31%); .mov (24%); .avi (17%); and others (28%).

Resolution Used for Image-Based Products

- 300 dpi (58%); 600 dpi (27%); 1200 dpi (13%); and others (2%).

Navigational or Search Tools Used

- Internet browser (24%); html tags (4%); glimpse (3%); others (35%); and not specified (34%).

The existing organizations and established processes used to develop standards are now generally recognized as too slow to be effective. New processes and organizations, mostly within the Internet community and through industry consortia, are providing the framework for developing new networking and digitization standards. Certain digitization-related standards, however, will continue to be developed exclusively within the traditional standards organizations (e.g., database Structured Query Language-SQL).

What Are Standards and Best Current Practices?

Information technology standards are detailed technical guidelines used as a means of establishing uniformity in an area of computing development.

De jure standards are usually created through a formal process based on the work of a cooperative group or committee of experts.

De facto standards are usually those whose status is conferred by their use in the marketplace and are commonly, but not always, proprietary in nature.

Best current practices identify the optimal implementation and uses of particular technologies. These practices are documented and shared in formal or informal ways by technical experts involved in operational use of technologies.

⁷ Annex 4, "Selected Standards in the Digitization Process", is illustrative of the plethora of standards.

In an era of declining budgets, there is increasing pressure across government to clearly demonstrate added value and cost savings when implementing new services and technologies. The challenge for all government institutions is to ensure that technical infrastructures serve the varying mandate requirements of each federal institution, while reliably providing quality service to its users both within and outside government. Furthermore, the infrastructure must be affordable and sustainable over its life cycle and must be able to evolve or scale to meet new user requirements or technological advances.

All standards have strengths and weaknesses. Every standard has a use and user. But no single standard or set of standards can satisfy the requirements of all users, in all places, at all times. The use of appropriate standards and best current practices can assist federal institutions in balancing the need for technical flexibility to meet organizational objectives with the need to maintain a level of compatibility that enables the user to share or exchange resources. Properly utilized, digitization standards and best current practices can assist organizations in their efforts to successfully cope with emerging new technologies.

It follows from these considerations that standards and best current practices should be used, whenever possible, to further organizational goals and to encourage interoperability across federal institutions and between the government and the public. However, standards and best current practices alone are not sufficient to ensure interoperability. Government will also need to share technical information, understand user needs and communicate and cooperate across federal institutions.

For long-term electronic storage, best current practices suggest that key digital resources should be maintained and migrated to new technological systems as they become available. The best way to ensure the preservation and accessibility of electronic resources over time is for the information to remain with the federal institution that creates or manages it as long as it is actively required. When the originating department no longer uses the information, it is then transferred to either the National Archives or the National Library, depending on the type of information.

Federal institutions must be responsible for managing and providing access to the information that they have created. Standards and common practices make the processes that support these responsibilities more uniform and in turn facilitate access to government information resources.

Proposed Principles Guiding the Use of Digitization Standards and Best Current Practices

1. Government systems should use appropriate standards and best current practices.
2. Every standard has its user.
3. The measure of success of any standards-based technology is the ability to meet user needs.
4. Standards are not an end in themselves.
5. Interoperability is a goal to be constantly considered in measuring success.
6. Standards, procurement processes and technology systems are interdependent.
7. Electronic information should be available for effective reuse and retention.
8. International standards should guide practice when these are appropriate, effective and available.

The government-wide role is to promote the use of standards-based solutions. The government does not, contrary to popular belief, develop core standards. For example,

the federal government did not develop any e-mail standards, but it did define certain data elements needed for community-wide use (e.g., naming conventions for departmental names).

It is clear that the private sector will be largely responsible for the development and deployment of the infrastructure for the Information Highway. It follows that the private sector will be the leader in ensuring that the infrastructure is interoperable. Nonetheless, the federal government should continue to look for opportunities to enhance and expand the use of standards in digital infrastructure through partnerships with the private and public sector. When private sector mechanisms for developing digitization standards do not meet the needs of particular user communities, the government should continue to work with industry to define and develop those standards (e.g., Canadian Aboriginal syllabics encoding).

To promote economies and efficiencies in the global information infrastructure, information technology standards must be based on a strong international consensus and market acceptance. Such global standards increase application interoperability, support the development of cost-effective technical solutions, promote quality of service, and support cultural diversity. The challenge of developing global standards is to provide these benefits in a timely and efficient manner, and to build upon existing efforts to develop national and regional information infrastructures.

Government should provide guidance on the applicability and use of de jure and de facto standards in the provision of government services. Government departments, agencies and Crown corporations need to work with their communities of users to develop a standard and to establish common ways of using standards (i.e., profiles) and best practices.

The following recommendations are primarily directed to Treasury Board's Chief Information Officer, to encourage Treasury Board's continued leadership role in these areas and to further collaboration across federal departments, agencies and Crown corporations in the areas of digitization standards and best practices.

A Mechanism for Sharing Technical Information

4.1 As per Recommendation 4.2 of the Phase 1 Final Report of the Information Highway Advisory Council, *Connection, Community, Content* (1995), an appropriate government-industry model is required to establish common standards in the area of digitization activities. A mechanism should be established to facilitate the sharing of technical and product information and emerging technologies, and to assist in product evaluation, benchmarking and procurement.

The objective of this mechanism is to build strong "peer-to-peer" linkages among government, academia and private sector experts to address technical digitization standards issues and sharing of operational best practices. One model that should be considered for this mechanism is that of the Internet Engineering Task Force. This mechanism would also complement Treasury Board's shared systems

initiatives and other interdepartmental efforts, particularly Public Works and Government Services Canada's Government Telecommunications and Informatics Services (GTIS).

The tasks such a mechanism would address include, but are not limited to:

- a. establishing and maintaining the government knowledge base about new technologies, evaluations, standards and best practices;
- b. facilitating development of consensus and dissemination of best current practices in various technical areas, for example through the use of open ad hoc working groups to provide specific technical guidance, develop best current practices, or provide intervention in standards processes, as required; and
- c. identifying and publishing best practices for evaluating past performance of vendors' services and products.

Navigation and Retrieval

4.2 A mechanism should be established to advise government on emerging standards and technologies in the areas of navigation and retrieval of networked information, including but not limited to metadata initiatives, locator naming systems, link maintenance and retrieval technologies and services. In particular, the mechanism would identify best practices for metadata use, evaluate retrieval technologies as they evolve, and assist in the development of a scalable architecture for the effective retrieval of electronic information, both for government and general public use.

Document Standards

4.3 The government should continue and expand its efforts to seek solutions or best practices to address the problem of the diversity of document formats across government agencies. This effort is necessary to ensure the interoperability and long-term preservation of government documents. It should be directed towards providing guidance, standards and best practices for document and records creation in federal institutions.

The present diversity of document file formats being used in government continues to have a significant detrimental impact upon the operations of all government departments. The document formats currently being used—for example, the multiple variations of MS Word or WordPerfect, RTF, HTML, XML/SGML, PostScript, PDF and desktop publishing formats—are frequently incompatible and non-interoperable. This diversity of formats also has a detrimental effect on long-term preservation of the documents. Maintaining the archival integrity and accessibility of multiple file formats will be an extremely difficult and costly undertaking for the National Archives and National Library, or agencies charged with providing long-term preservation of electronic

information resources. It is likely that a substantial amount of government information has already been lost due to obsolescence of technology and non-readable file formats.

Use of Standards-Based Information Technologies

4.4 Federal institutions should acquire and use standards-based digitization technologies wherever possible, and ensure that these acquisitions meet specific and well-defined user requirements, which should include interoperability with other government systems. In addition to other factors, success in the use of information technologies should be measured by how well departments satisfy these requirements.

Licensing of Proprietary Technologies on Reasonable Terms

4.5 To assist in providing widespread government interoperability in strategic areas (i.e., desktop applications such as word processing, electronic mail, Web browsers, spreadsheet or presentation applications) and in Internet servers (i.e., WWW servers, mail systems, push publishing technology, information management software) proprietary technologies for federal institutions should be licensed on reasonable terms. Procurement practices for digitization technologies should seek to follow standard commercial acquisition practices for the use of COTS (commercial-off-the-shelf) technologies.

Many issues that government is currently addressing would be significantly mitigated if all government agencies used a common desktop environment. For example, the adoption of common applications in key areas such as word processing, spreadsheet and presentation formats would address many interoperability, migration, training and preservation issues that continue to plague federal institutions.

Preservation

4.6 To ensure preservation of and access to digital information over time, the National Archives of Canada, the National Library of Canada and the Department of Canadian Heritage should jointly conduct research into preservation practices for digital information. In addition, the established mechanism, as per Recommendation 4.1, will support this research through the monitoring and assessment of current work being undertaken nationally and internationally. This research would contribute to the government's knowledge base of new technologies, evaluations, standards and best current practices. This recommendation is complementary to Recommendation 2.6 under Selection of Materials for Digitization.

The preservation of digital collections is a difficult problem: Currently, there are no accepted digital preservation formats or standards, only strategies. One strategy currently being considered in the archival community is to use the digital

object to produce computer output microfilm (COM) that meets preservation standards for quality and permanence. Evaluating such strategies will require looking at issues of quality, expense and process, to determine their feasibility and applicability to the specific digital resources being considered for preservation.

Digitization facilitates new ways of communicating information. The economics of digitization and subsequent dissemination are, however, different from those of conventional publication. Accordingly, the Government of Canada must show leadership by exploring innovative methods for digitizing its holdings and encouraging new funding approaches and strategies. This must become a priority, particularly in light of decreasing resource levels.

The bulk of Canada's government information holdings, both scientific and cultural, are not accessible in electronic format because the cost of conversion is prohibitive, particularly in the current fiscal environment. This is especially true with the digitization of legacy collections. With little or no additional allocations from government or other sources specifically earmarked for electronic conversion of significant retrospective collections, little digitization of valuable older materials will be accomplished.

Increasingly, government departments, agencies and Crown corporations are adapting to the digital environment. Through reallocation within existing appropriations, digital access to government information holdings has been achieved for a limited subset of material, primarily material acquired or generated in the last two to five years. In the Task Force's survey of federal digitization activities, 75 percent of federal institutions reported the primary source for funding for digital products as the federal government. Departments and agencies have thus achieved some success in providing electronic access to current materials.

Where the federal government has begun to make some information holdings available electronically to increase efficiency, improve access and lower costs, Canadians have shown remarkable expressions of interest. Examples of this can be seen through the high use of many federal institutions' Web sites. Moreover, it can be demonstrated that electronic access to government information has the potential to increase public awareness of non-digital information held by government. This awareness often leads to public demand for materials that are not digitized; these demands create pressure to digitize more

The Canadian Museum of Civilization: A Funding Case Study

Ongoing Digitization

- The Canadian Museum of Civilization (CMCC) digitizes all new acquisitions. It also creates digital records for items from the collection that are exhibited, travel to other institutions, or are made available on the Web site or for other outreach initiatives.

Digitizing Retrospective Collections through Partnerships

- Partnerships have been beneficial in making some of CMCC's retrospective collections available in digital form. Since entering a strategic alliance with Kodak Canada in 1994, CMCC has digitized over 250,000 images at a cost of \$2 million. This represents approximately 25 percent of the collections CMCC would like to digitize. Over this four-year period, 14 full-time equivalents were created within the museum and Kodak hired three full-time employees to work on site at CMCC.

- Other private sector partners have been attracted to the Museum as a result of digitization initiatives. The 3D Imaging project, a joint collaboration between the National Research Council and Hymark Imaging, is one example. Other private sector partners include Corel, which has purchased over 600 images from the digitized collection; Corbus, which has licensed up to 5,000 images; and Academic Press, which will provide Web access to thousands of Museum images with royalties flowing back to the Museum.

Future Digitization of Retrospective Collections

- Due to an environment of fiscal restraint, funding for the digitization of the remaining retrospective collections is difficult. Although it continues to be a priority for CMCC, without additional funds access to these collections will be limited.

materials. However, government agencies will need to continue to publish information in paper formats for the foreseeable future. Providing both conventional and electronic publications has implications for resources, especially in the short term.

The 1995 IHAC report suggests that government may solicit competitive bids from the private sector in its digitization initiatives (*Connection, Community, Content*, p. 125). However, the private sector will not invest without adequate incentives. In fact, the survey results show that only 25 percent of respondents are involved in digitization partnership agreements. Of the federal institutions involved in partnership arrangements, 28 percent are partnering with the private sector, 22 percent with not-for-profit organizations, 11 percent with educational organizations, and the remaining 39 percent with other types of organizations, primarily government. Currently, neither the regulatory environment nor the potential for revenue generation or cost-recovery encourages such partnership.

Continuing changes in standards and network protocols, technological innovations and new types of media and assets all demand radical shifts in the way the federal government manages information and provides access. These changes may be accommodated through reallocation of resources within existing appropriations, but in some cases additional funding may be required to ensure that the federal government can respond to the changes while continuing to meet public expectations and policy objectives.

Given the range of funding challenges, new government investment is required to support digitization. Decisions to make digital copies available and to convert retrospective collections should be based on a sound business-like methodology and sufficient user demand. The private sector can be encouraged to participate in this effort. Within a framework of five funding strategies, the following recommendations are proposed:

Strategy 1: Use Available Resources

5.1 Existing departmental and agency allocations must continue to absorb the costs of ongoing operations and practices in the provision of access to already digitized material. Digitization must be recognized as an essential component of existing and planned programs. Funding of existing and new programs should include specific allocations for digitization.

Example: All new material that comes into the Canadian Museum of Civilization is made available in digital format. Scanned images are made part of the public record and paid for through appropriations.

Strategy 2: Exploit the Policy Framework

5.2 Treasury Board should take responsibility to ensure that guidelines are in place to facilitate collaborative arrangements, to limit government costs and to exploit private sector funding possibilities. In addition, some flexibility should be allowed for departments and agencies seeking to reinvest revenues in digitization projects.

5.3 Repayable advances from Treasury Board for specific digitization projects, which can be supported by a business plan, may be available within the existing funding processes.

Example: Geomatics Canada (NRCan) uses a Revolving Fund to invest in the production of digital maps. The fund requires careful management but has allowed for flexibility in digitizing a marketable product and in cost-recovery.

Strategy 3: Encourage Joint Action by Departments, Agencies and Crown Corporations

5.4 Federal institutions should be encouraged to collaborate with other public sector institutions, where complementary mandates exist and where Treasury Board infrastructure encourages flexibility in program delivery.

5.5 The government should encourage jointly funded digitization projects through federally initiated education and awareness programs. These programs should target both public and private sector organizations. This will lead to the development of expertise as well as create greater potential for innovative funding solutions for digitization projects.

5.6 Federal departments, agencies and Crown corporations should link their digitization initiatives to other government objectives, such as youth employment and the development of the Canadian digitization and multimedia industry.

Example: Under the direction of Treasury Board, the Activity Base Costing User Group is an interdepartmental working group that has a Web site to share and provide information.

Example: Industry Canada's SchoolNet Digital Collections program funds contracts covering youth wages to digitize materials for display on SchoolNet.

Strategy 4: Involve the Private Sector

5.7 **Federal institutions should develop flexible partnership arrangements with the private sector for joint investment and revenue sharing.** Such a partnership allows the government to take advantage of private sector expertise and flexibility and also provides a stream of revenue through the licensing of its products to assist in more product creation.

5.8 **The government should encourage joint public-private digitization initiatives through appropriate tax exemptions and licensing arrangements for the private sector participants.**

Examples: The Canadian Hydrographic Service (CHS), Fisheries and Oceans Canada, has formed a partnership with Nautical Data International of St. John's, Newfoundland. The company markets and distributes CHS's digital chart products to the world through its Web site.

The National Archives of Canada Act makes provision in section 10 (1) for the National Archives of Canada to receive donations and bequests towards the support of its mandate through the establishment of a National Archives Account.

Strategy 5: Target New Government Investment for Priority Digitization Projects

5.9 **The federal government should establish a central fund for digitizing legacy collections, including digitization projects whose primary justification is the provision of information relating to the "public good".**

A central fund accessible to both small and large federal institutions can provide the means for digital content development in Canada. Centralization of funding for nation-wide digitization projects will unify government priorities and directives and promote the selection and accessibility of Canadian digital content.

Examples: IHAC (1997) recommended that \$50 million be invested over three years for the Canada Health Information System, to provide efficient and timely information about treatments and health care.

C. CONCLUSION

Steps To Success

The Task Force has consolidated and prioritized the recommendations from the five research areas into a three-phased implementation strategy entitled "Steps to Success". The following three phases are intended to refine (e.g., further research, analysis, consultation), implement and promulgate the proposed recommendations.

PHASE I: BUILDING ON THE FOUNDATION

This phase would expand on the work of the Task Force. It emphasizes the urgent need for continued momentum and visibility on digitization issues; puts in place the necessary steps for action; broadens interdepartmental communication and cooperation and provides for detailed costing and timelines for all Phase I through Phase III recommendations.

Determining Roles, Responsibilities and a Support Structure

To sustain the momentum created by the work of the Task Force and its contribution as a starting point of investigation into issues related to digitization, the Task Force recommends:

- striking a small steering committee of senior federal officials, including some members from the Task Force, to oversee and guide the implementation of the Task Force recommendations. The steering committee should take immediate action to identify key players and establish a support structure to undertake the work required to implement the recommendations. While many options are possible for a support structure, the following might be considered:
 - establish interdepartmental working groups comprising policy, technical or other appropriate experts that would be responsible for implementing the Task Force recommendations under the general direction of the steering committee;
 - continue the secretariat function by retaining the existing Task Force Secretariat or reconstituting a similar body to support the work of the interdepartmental working groups; and
 - maintain a permanent Web site for sharing of information on digitization issues and activities, and continuing the dialogue through electronic discussion lists.

Validation of Recommendations

The steering committee would, by appropriate means, undertake the validation of the Task Force's recommendations with targeted non-governmental stakeholders who are users of government information.

Coordinated Implementation

Successful implementation of the Task Force's recommendations will require the active participation of federal institutions recognized as having experience and expertise on policy and technical issues surrounding digitization. Particularly necessary would be the participation of the Treasury Board Secretariat, in its commitment to "getting government right," as well as chief information officers across all federal institutions.

Therefore, in close collaboration with the identified key federal institutions and their officials, the steering committee, or its assigned working groups, would:

- develop interim guidelines, particularly in the areas of intellectual property and standards and best practices, to avoid duplication of effort in the implementation of the recommendations, recognizing that digitization activities are occurring across government.

With respect to Accessibility of Digitized Content,

- identify those offices and persons within government that are best equipped to participate in the development of an implementation plan for the Federal Information Policy (Rec 1.1). The Policy would provide the basis to rationalize current legislation and disparate information policies into one comprehensive framework, ensuring that legislation and policy are technologically neutral, where possible, or strengthened to reflect the realities of the digital environment (Rec 1.1 a). Striking ad hoc groups of specialists to further research the 10 components recommended for consideration in the context of the Federal Information Policy will be required (Rec 1.1 a-j). For example, the most immediate component to be dealt with would be to:
 - initiate discussions across federal institutions on the "essential", "key" and "customized" information categories based on the proposed "Access and Remuneration Continuum" (Rec 1.1 b). These discussions would build on the proposed "public good" criteria proposed for the selection of materials for digitization (Rec 2.1).
- initiate studies to determine the needs of disadvantaged and special-needs segments of the Canadian population so that information technologies can be used to enhance access to federal digital information (Rec 1.3 a).
- begin studies to identify means to strengthen the technical infrastructure required by the National Library of Canada and the National Archives of Canada to ensure long-term access to federal digital information (Rec 1.5).

With respect to Selection of Materials for Digitization,

- disseminate to all federal institutions, through appropriate channels, "public good" criteria and other proposal criteria for the selection of materials for digitization. The criteria represent the current understanding of "public good" and can be

applied immediately by federal institutions in their selection of materials for digitization (Rec 2.1, 2.3). The criteria would be the basis for accessing the central fund (Rec 5.9).

- initiate research into the costs and benefits of providing digital information to the general population and target user groups by choosing representative digitization projects for objective impact studies (Rec 2.2).

With respect to Common Issues of Intellectual Property,

- identify those offices and persons within government that are best equipped to participate in the development of an administrative policy and guidelines relating to copyright (Rec 3.1). A core component of the policy and guidelines would be a “single window” mechanism for facilitating rights clearance. This mechanism essentially integrates three broad elements reflected in the recommendations: a centralized licensing scheme, model licences to support the centralized licensing scheme (Rec 3.2), and a referral system. These three elements need to develop in tandem if the objectives of the recommendations are to be achieved by the conclusion of Phase III. Implementation of the “single window” would also require that:
 - research be conducted to assess current government practices with respect to copyright licensing.
 - federal institutions be informed of the potential benefits of the “single window” and consulted about their own needs.
 - links be established with knowledgeable parties within government in order to share information on criteria and standards relating to the use of encryption, identifiers and other forms of technological protection.
- monitor and support, throughout the proposed three implementation phases, the progress of ongoing federal initiatives designed to:
 - resolve, in consultation with stakeholders, outstanding copyright issues related to the Information Highway (Rec 3.3).
 - examine, in the context of Phase III of copyright reform, the question of whether the *Copyright Act* should be amended to set out sanctions against the unlawful tampering or bypassing of any kind of encryption, copyguard or copyright management information (Rec 3.4).
 - resolve, through current domestic and international discussions, the issue of whether some form of protection is desirable for information holdings, such as certain types of databases, that do not benefit from copyright protection (Rec 3.5).

- further negotiations conducted in international forums concerning the challenges posed to copyright by the transnational character of the Information Highway (Rec 3.6).
- strengthen and create new programs for raising copyright awareness, both within and outside the government (Rec 3.7).

With respect to Identification of Standards and Best Practices,

- identify an appropriate mechanism to facilitate government-industry sharing of technical and product information and emerging technologies that would encourage interoperability and interconnectivity. The mechanism would essentially be tasked with developing a government knowledge base about new technologies, evaluations, standards and best practices (Rec 4.1).
- once the appropriate mechanism is in place, and with a view to achieving interoperability across government and between federal institutions and the public as well as promoting government-wide economies and efficiencies in the technical infrastructure:
 - explore challenges with respect to document standards across government institutions and then produce a report that provides guidance, procedures, and standards and best practices for records creation in federal institutions (Rec 4.3).
 - initiate research and prepare a report on emerging standards and technologies in the areas of navigation and retrieval of networked information for the effective retrieval of federal digital information by both the government and the public (Rec 4.2).
 - initiate research on preservation practices for digital information in partnership with the National Archives, the National Library and the Department of Canadian Heritage (Rec 4.6).
 - disseminate information and research findings as prepared by the appropriate mechanism and encourage federal institutions to acquire and use standards-based digitization technologies wherever possible, so that acquisitions meet specific and well-defined user requirements (Rec 4.4).

With respect to Funding Strategies for Digital Conversion,

- research, compile and disseminate information on existing funding mechanisms and the Task Force's recommended funding strategies, through the Web site and other channels deemed appropriate, so that all funding possibilities, including partnership with the private sector and within and between governments, can be effectively utilized by federal institutions (Rec 5.1 to 5.8).

- prepare a proposal for the establishment of a central fund dedicated to digitizing legacy collections (Rec 5.9), including digitization projects whose primary justification is the provision of the “public good” (Rec 2.1).

PHASE II: CREATING THE INFOSTRUCTURE

This phase represents the consolidation and implementation stage for Phase I activities. Building on the foundation and successes of the previous phase and in continued close collaboration with the identified key federal institutions and their officials, the steering committee, or its assigned working group(s), would:

With respect to Accessibility of Digitized Content,

- act on the priorities identified in the implementation plan for the Federal Information Policy (Rec 1.1).
- disseminate results on the studies determining the needs of disadvantaged and special-needs segments of the Canadian population across federal institutions. In addition, begin developing or strengthening existing guidelines for providing digital information that has been adapted for accessibility by disadvantaged and special-needs groups (Rec 1.3 a, b).
- support government-wide initiatives that would identify, locate and allow for a “single window” access to federal information holdings in a digital format (Rec 1.2). The implementation of a single-window approach to rights licensing for copyright (Rec 3.1) and the research into standards and best practices of information technology, particularly in the areas of navigation and retrieval (Rec 4.2), will be integral components of any single-window access initiative. This would also include:
 - initiating discussions for the development of a system of authentication for digital Canadian government information to ensure that users are accessing authentic information (Rec 1.4).

With respect to Selection of Materials for Digitization,

- disseminate throughout government the results of impact studies on the costs and benefits of the provision of digital information to assist in the future selection of materials to be digitized (Rec 2.2).
- based on the results of the impact studies (Rec 2.2), develop recommendations and/or guidelines for federal institutions to support and promote continued work in this area.

- *With respect to Common Issues of Intellectual Property,*
- continue to coordinate implementation of the administrative policy and guidelines dealing with copyright in a digital environment.
- evaluate the progress of ongoing federal copyright initiatives in Canada and in the context of international activities.

With respect to Identification of Standards and Best Practices,

- initiate research, through the mechanism established in Phase I, on licensing of proprietary technologies on reasonable terms so as to promote widespread government interoperability in strategic areas (Rec 4.5).

With respect to Funding Strategies for Digital Conversion,

- have established a central fund dedicated to digitizing legacy collections and digitization projects contributing to the public good. Funding proposals, based on specific criteria, would be accepted for consideration (Rec 5.9).

PHASE III: REALIZING THE DIGITAL CONTRIBUTION

At this stage, the process for implementing digitization initiatives would be well established and augmented by effective horizontal integration, communication and interdepartmental coordination. Phase III represents the platform for effective partnership arrangements, long-term funding, awareness campaigns and mechanisms for ongoing monitoring and evaluation. The following achievements are anticipated, recognizing that work in many of these areas will continue:

Accessibility of Digitized Content

Anticipated Achievements:

- promulgation of the Federal Information Policy.
- adoption of a system of authentication for digitized Canadian government information.
- implementation of means to strengthen the technical infrastructure required by the National Library of Canada and National Archives of Canada for preservation and long-term access to digital information.

Ongoing Work:

- continuing to promote and act on government-wide initiatives that would identify, locate and allow for a single-window access to federal information holdings in a digital format.

Common Issues of Intellectual Property

Anticipated Achievements:

- implementation of the federal administrative policy and guidelines dealing with copyright in a digital environment and, in particular, the single window for streamlining rights licensing.

Identification of Standards and Best Practices

Anticipated Achievements:

- interoperability across government and between federal institutions and the public as a direct result of the increase in the knowledge base of standards and best practices shared throughout the government and the private sector in the areas of document standards, navigation and retrieval, licensing of proprietary technologies, and preservation practices.

Ongoing Work:

- continuing to investigate current problems in information technology to provide guidance on standards and best current practices to achieve interoperability.

Funding Strategies for Digital Conversion

Anticipated Achievements:

- a significant increase in the stock of digital information available to user groups due to increased availability of funding.

Ongoing Work:

- monitoring and evaluating, using existing auditing processes, the funding mechanisms for digital conversion, including the use of the central fund, and improving and adapting the design of these mechanisms if necessary.

Realizing The Potential Of The Digital Contribution

Digitization offers a powerful opportunity to strengthen Canada's presence on the Information Highway. The digitization of government holdings of information, art, artifacts and scientific collections not only affords Canadians greater access but also provides government with innovative ways to stimulate job creation and economic

growth. In a few short years, the Internet has become central to the Information Highway's evolution and will continue to provide unimagined scope, adaptability and opportunity for future generations. The growth in Internet access continues, estimated at a rate of approximately 50 percent annually (*Canadian Internet Survey*, Spring 1997, ACNielsen). The benefits of digitization are broad based—increasing young people's knowledge of Canada's achievements, offsetting the effect of distance for rural communities, empowering educational programs, promoting health care, and providing new market opportunities for small and medium-sized businesses. Strategic investments in programs such as SchoolNet Digital Collections have already provided many young people with an opportunity to develop the skills and experience necessary to make a smooth and productive entry into the job market.

The transition to the digital environment cannot be ignored. But at the same time, it remains important for the federal government to continue providing information in conventional formats for those Canadians who do not have the technology or skills to access digital content. The application of information and communication technologies must not contribute to widening the gap between the information "haves" and "have nots". For the foreseeable future, the transition to a digital environment must be tempered to ensure the best possible access to government information for all Canadians.

The recommendations in this report are an important starting point in the area of digitization and provide government with a three-phased strategic framework for action. While federal departments, agencies and Crown corporations are increasing their use of information technology (see Annex 1) as a means to disseminate their information holdings, a great deal still remains to be done to ensure that Canada is positioned to meet the challenges and seize the opportunities of the digital age. The recommendations clearly outline the steps necessary to realize the full potential of government digitization activities and overcome the obstacles to an enabling environment.

From an international perspective, governments are aggressively making digital information available and accessible on-line. The French government already has a program to digitize heritage information to ensure "cultural democracy". In the United States, the National Information Infrastructure is being designed to provide easier access to government information and improve government procurement, while the Commonwealth Secretariat is actively considering the development of on-line information sharing and mutual assistance among Commonwealth countries.

The members of the Task Force urge the government to maintain its momentum and profile on digitization initiatives to ensure Canada's successful transition to a knowledge-based economy that also reinforces Canada's cultural and social values. The time to act is now.

ANNEXES

Annex 1: Selected Federal Digitization Projects

The following examples of federal digitization projects demonstrate how digitized information can be accessed in real time across geographic boundaries, thus enhancing equity and ease of access to information among Canadians and contributing to the promotion of citizenship and national identity.

The **Canadian Museum of Civilization** (CMCC) holds in trust millions of objects but, like most museums, does not have enough room to display them all. Now, however, with the development of the Digital 3D Imaging System, CMCC's artifacts can be replicated in 3D and these digital copies examined as if they were real. The AMUSE (Access to Museums) project was undertaken to demonstrate a revolutionary 3D laser scanning technology developed by the National Research Council of Canada and commercialized by Hymarc Ltd. A laser scanning camera digitally captures an object's precise shape and colour simultaneously. Once objects have been digitized, museums can use the digital images for remote viewing and various research, conservation, publication, reproduction and insurance purposes.

The **Canada Institute for Scientific and Technical Information** (CISTI), a part of the **National Research Council of Canada** (NRC), provides digital access to scientific, technical and medical data and information from Canadian and international sources, and helps users seeking this class of information navigate through a suite of digital tools, including many operating on the Internet. As a world leader in rapid, high-quality delivery of copies of technical documents, CISTI uses temporary digitization of some 2,500 documents per day from its extensive collection to facilitate this access. Finally, as Canada's largest technical publisher, it publishes a growing set of full-text digital scientific journals.

In the fall of 1997, the **National Gallery of Canada** (NGC) published a catalogue of its Canadian collection on CD-ROM. More than 13,000 Canadian works are documented, illustrated and presented in an interactive context. The NGC is also preparing for the December 1998 opening of The Learning Centre, which will offer a rich program of multimedia productions as well as access to an entire collection database, including visuals. Individuals or groups will have access to the Centre's progressive program on-site or through various international digital networks. On another front, the NGC is playing a leadership role in the development of The Art Museum Image Consortium of Canada. AMICO Canada is a non-profit corporation formed by leading Canadian art galleries and museums to provide educational access to and delivery of cultural heritage information by creating, maintaining and licensing a collective digital library of images and documentation of works in their collections. The Canadian consortium is being formed to ensure that Canadian content will be available electronically. Products derived from the digital library will be offered to different markets under licences and through a number of distribution channels.

The **Canadian Forestry Service**, Natural Resources Canada, has developed the Canadian Wildland Fire Information System, which automatically accesses weather data from the Atmospheric Environment Service national observing network, as well as computer-generated numeric weather forecasts produced by the Climate Analysis Centre. It

transforms the data into elements of the Canadian Fire Weather Index and the Fire Behaviour Prediction System. Using Global Information System (GIS) technology, station data are integrated into daily national observed and forecast fire-danger maps. The maps are disseminated via the World Wide Web to fire management agencies and to Canadian and global audiences. By accessing global weather networks, the system has been adapted to produce maps for Florida, the Association of Southeast Asian Nations (ASEAN) region, and the northern hemisphere.

The **National Film Board** (NFB), working with organizations like Vidéotron in Montreal and Oz in Edmonton, is field testing digital distance access by educational institutions to selected films from its collection. Its award-winning Internet site, which provides catalogue information on audiovisual holdings, is being further developed to permit educational institutions and home consumers to place orders for videocassettes on-line. The NFB has developed an extensive children's site—*The Prince and I*—in English and French specifically for access on the Internet, and has worked with a range of private sector developers to produce sophisticated educational CD-ROMs such as *Making History: Louis Riel and Has Anyone Seen My Umbrella?*, which are currently being launched into the marketplace. The NFB has also worked with Canadian Heritage Information Network and the national museums to develop other CD-ROMs such as *Canada's Visual History* and *Flypast*.

The **Canadian Broadcasting Corporation** (CBC/SRC) continues to expand its English and French services on the Web, reaching out to Canadians across the country and around the world. In the last year, CBC/SRC opened new Web sites, integrated new technologies and added numerous on-line discussion forums. Internet users can now go to the Newsworld On-line Web site to catch up on the day's breaking news stories. New content has been added through a number of sites such as *Adrienne Clarkson Presents* and *Demain*. CBC/SRC has also become a leader in the uses of Internet multimedia so that you can now find live video and audio on its Web pages. CBC/SRC Audience Relations has also established its own Internet presence. Using e-mail, message boards, and feedback forms, the CBC/SRC is responding quicker than ever to its audience.

Strategis is Canada's largest business site on the Internet and contains over 70 information collections, 750,000 pages of text and over 3 gigabytes of current data. **Industry Canada** developed Strategis, with partners in the private sector, other federal departments and other levels of government. Since its launch in March 1996, it has been visited over 1.4 million times. Strategis is now averaging close to 150,000 visits each month and is expected to attract close to 200,000 visits in February 1998, tripling February 1997 levels. Strategis has only begun to tap into its primary market of 900,000 business users or companies, and into a secondary market of researchers, universities, consultants, lawyers and accountants. Canadians can access on-line a host of economic information such as company information, international business opportunities, micro-economic research and statistical analysis, and consumer information.

For 25 years, the **Canadian Heritage Information Network** (CHIN) has been breaking new ground by developing a comprehensive digitized inventory of Canadian content. This special operating agency of the Department of Canadian Heritage now provides on-line access via the Internet to comprehensive reference services and digitized cataloguing

information on 25 million objects in the national inventories of Canadian museum collections. Its Web site constitutes a value-added gateway to other Canadian and international heritage services, including a guide to Canadian museums and galleries, virtual exhibits, professional forums, listservs and special presentations. Current activities include a research and development project to develop an interface that enables the user to define a point of view, navigation strategy and search universe, while presenting the results in a learnable form.

The **Industry Canada SchoolNet Digital Collections** (SDC) program has enabled 15 federal departments and agencies, as well as some 150 other contractors, to hire young people to digitize collections and display them on SchoolNet. The program is designed to provide jobs for youth in technology, encourage the creation of new business undertakings and demonstrate the productivity enhancement potential of digitization while building the stock of significant Canadian content on the Information Highway. From the pilot phase to November 1997, over 1,000 young Canadians have been employed, some 200 projects have been completed or are in production, and over 100 collections are displayed on SchoolNet. This is understood to be the largest single collection of Canadian content on the Web.

The **National Library of Canada** (NLC) has built on its traditional library and networking strengths to implement an array of Internet-accessible services, databases and collections. *resAnet* provides WWW access to the National Library's bibliographic records and to a burgeoning collection of networked electronic publications. Through *Access AMICUS*, Canadian libraries and researchers can search on-line through more than 12 million bibliographic authority records incorporating the holdings of Canadian libraries from across the country. The flexibility and power of *Access AMICUS* make it an ideal tool for reference work, information verification, cataloguing support and interlibrary loans. The NLC has agreements with a growing number of Canadian private and public sector publishers to obtain copies of their networked electronic publications. This innovative program helps ensure long-term preservation of and access to these significant electronic publications. The NLC has made a number of its holdings accessible on the Information Highway by hiring young people under the **SchoolNet Digital Collections** program to digitize material and display it on SchoolNet. These displays feature famous Canadian writers such as Gabrielle Roy and Stephen Leacock, the world-renowned Glenn Gould and "North: Landscape of the Imagination", as well as unique reference databases such as the Canadian Music Periodical Index and the Index to Federal Royal Commissions. All of these resources, services and systems, and many more, can be accessed via the NLC Web site.

The **National Archives of Canada** has also employed young people under the **SchoolNet Digital Collections** program. Projects have ranged from the digitization of a collection of Indian treaties (done by students in Nelson House, MB) to digitization of 20 percent of the million pages of Attestation Papers (enlistment documents) from the First World War Canadian Expeditionary Force. The digitized documents are being integrated into a database that is accessed through the National Archives Web site as well as the SchoolNet site. Digitization of the Attestation Papers is enabling the National Archives to improve its service to the public, preserve fragile records from the damage of excessive handling,

and increase awareness of a key period of Canadian history, as well as providing skilled jobs for dozens of young people in Renfrew, ON, and Gatineau, QC.

Legal Surveys Division (LSD), Natural Resources Canada, is at the forefront in the exploitation of digitization technologies to provide both enhanced effectiveness and efficient client service. The Division is in the process of completing two major digitization projects: the Survey Records Information System (SRIS), a digital database of the complete Canada Lands Survey Records (CLSR) which indexes all registered plans of Canada Lands; and on a significantly larger scale, the scanning and digitization of all plans held by the Division. To date, the scanning project has resulted in the digitization of over 34,000 plans (60 percent of the CLSR holdings) occupying some 5,000 megabytes of data storage. In conjunction with ongoing efforts to provide nation-wide remote access to LSD's data, these projects will permit surveyors and other stakeholders to deliver timely and cost-effective service to their clients and provide for sustainable economic growth.

NAISMap (National Atlas of Canada), **Natural Resources Canada**, is an example of an interactive, Web-based, popularized version of scientific and technical information in map form. It uses a selection of digital data sets to graphically portray national themes and related issues, and includes several range maps of endangered species. The most heavily used components of NAISMap are the interactive pages, including the "Geography Quiz" (testing knowledge of Canadian geography) and the interactive map maker. The interactive map maker lets users choose from over 200 spatial data layers to build their own maps; over one million interactive new maps were made last year. The NAISMap site won the Internet Society Award for Best Educational site in 1996 and the Government and Technology Award for innovation and technology in 1995. NAISMap will continue to evolve into a sophisticated tool enabling in-depth visualization and analysis of cross-discipline, national-level data.

The Photo Collection of the **Earth Sciences Information Centre (ESIC)**, **Natural Resources Canada**, contains over 520,000 images in a variety of formats: glass plate negatives, prints, safety film negatives, slides, scanned negatives and computer files. The Photo Collection supports the official research activities of the **Geological Survey of Canada** (GSC) and ensures the long-term preservation of the photographic holdings. The GSC's original mandate was not only to photograph geological formations, but also to make a record of the people and customs of Canada as encountered by geologists during their field work. As a result, a wide variety of topics are represented in the Photo Collection: the work of the GSC, the peoples of Canada, geographic locations across Canada, the advancement of technology in the geosciences and resource development, and Canada's varied environment. The photographic output of the GSC is now more research-focused. During the summer of 1997, over 350 slides were digitized and captured on a photo-CD, and may be made available as a CD product in the future. The slides consist of winning photos from the annual GSC photo competition. Several of the early images from the Photo Collection have been posted as thumbnail sketches as well as full images on the Earth Sciences Information Centre home page. By making this collection available in digital format, the ESIC is preserving and promoting a valuable and growing Canadian geoscience collection.

Annex 2: Digitization Survey

Digitization Survey: Digitization Activities, Plans and Priorities within Federal Departments and Agencies

1. BACKGROUND AND OBJECTIVES

In recent years information and communications technologies have made it possible to make information available and accessible in digitized format. Digitization within federal departments, agencies and Crown corporations has emerged as a vital way of disseminating federal information holdings and collections.

Comprehensive knowledge of departmental and agency digitization activities, priorities and best practices is critical to any further investigation, analysis or policy development in the field of digitization. Consequently, the Federal Task Force on Digitization developed a survey to determine the extent and nature of digitization activities within the federal government. The survey was limited to federal government collections and information holdings.

The survey was designed to obtain information on the federal government's digitization activities, specifically on:

- ⇒ Digitization Policies
- ⇒ Digitization Planning Objectives and Challenges
- ⇒ Costs of Digitization
- ⇒ Nature of Digital Content:
 - Audience
 - Purpose of Digital Products
 - Content of Digital Products
 - Types of Information Being Digitized
 - Information Provided Only in Digital Format
 - Digital Standards—Mark-up Languages, Resolution, Navigational and Search Tools
 - Digital Formats
 - Longevity of the Digital Product
- ⇒ Partnerships and Funding Arrangements
- ⇒ Digitization Plans and Priorities

The survey is a starting point in gathering data on federal digitization activities. The results form a preliminary baseline of data, but also highlight the necessity of future study. The survey questionnaire is found in Exhibit 2 of this Annex.

2. METHODOLOGY

The survey was mailed in June 1997 to 194 chief information officers and senior information management persons representing 93 federal government departments, agencies and Crown corporations. Recipients could access and complete the survey on-line through the Task Force Web site.

A total of 68 responses were received by August 1997, representing a response rate of 73 percent. For a complete list of survey participants, please see Exhibit 1 of this Annex.

3. GENERAL OBSERVATIONS

Digitization Policies Becoming an Increasing Focus

Institutional-level digitization policies are increasingly becoming a focus for the departments, agencies and Crown corporations surveyed. Approximately one-third of the federal institutions surveyed reported already having a digitization policy. Of the two-thirds that did not have a policy in place, approximately one-half were in the process of developing a policy.

Variance in the Nature of Digital Products

The combination of traits associated with digital products (audience, purpose for the product, content, types of information being digitized and digital standards) varied from product to product and seemed to coincide with the particular goals and mandate of the institutions surveyed and the needs of their clients.

Information Provided Only in Digital Format

Just over one-third of digital products are provided only in digital format. This may have the result of limiting access to federal information, given that not all Canadians have access to, or the skills to use, information technology.

Funding for Federal Digitization Products

Only one-quarter of the institutions surveyed are involved in partnership arrangements with other organizations. The most common partner is the private sector, followed by not-for-profit organizations. For three-quarters of institutions surveyed, the primary source of funding is the federal government. Since partnerships facilitate the digitization of federal information as well as stimulate economic growth, partnership agreements may be a viable option for more institutions.

More Complete and Detailed Data Are Needed on the Costs of Digitization

A clearer picture of the costs associated with digitization products is a key factor in planning and better-informed decision making. The high percentage of incomplete responses to the survey questions in the costing area prevents any accurate analysis of the results. More complete and detailed data should be obtained, breaking down the costs of digitization.

4. RESULTS

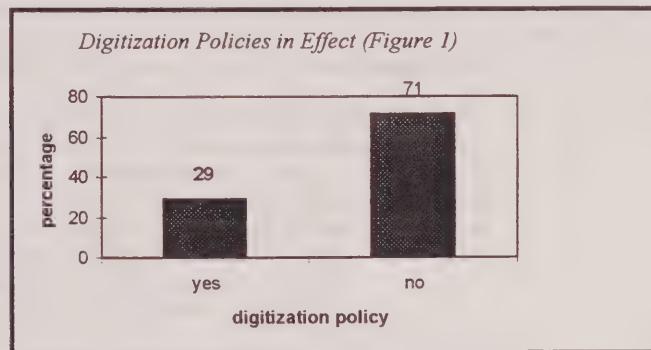
The results of the survey are presented as bar graphs and tables. Some of the percentages do not add up to 100 due to rounding.

A. Approaches to Digitization

1. Digitization Policies

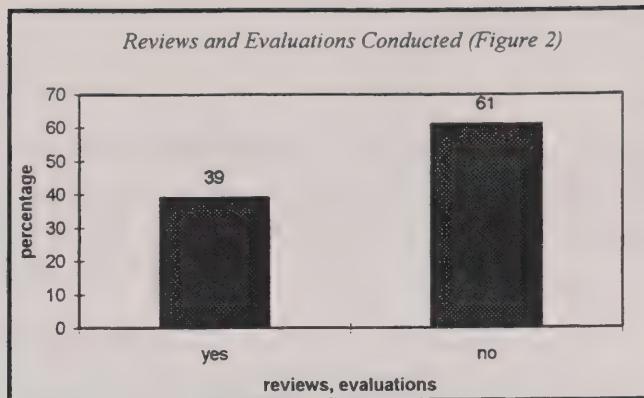
The emergence of digitization as a method of disseminating information has presented federal institutions with new challenges and opportunities. Some departments and agencies have developed digitization policies that address these challenges and take advantage of the opportunities that digitization presents.

Of the institutions surveyed, only 29 percent reported having a policy with respect to the digitization of federal holdings, while 71 percent reported that they did not have a digitization policy in place (see Figure 1).



Of the 71 percent of survey respondents who reported that they did not have a digitization policy, 51 percent said they were in the process of developing one.

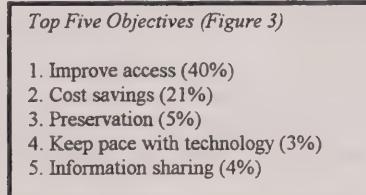
It is evident from the low number of "yes" responses that there needs to be more planning, organization and coordination at the institutional level. As the use of digitization as a means of dissemination increases, so too will the need for clear organizational policy guidelines aimed at enhancing access to federally held collections.



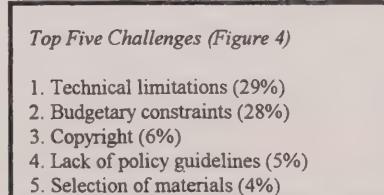
Less than half of the respondents reported having conducted a policy review or program evaluation to assess the effectiveness of their approach to digitization (see Figure 2). This low figure may indicate a gap in the digitization planning process. Evaluations and reviews are essential to measuring success. The feedback from these evaluations and reviews should be used in subsequent digitization planning.

2. Digitization Planning Objectives and Challenges

Institutional objectives with respect to the planning and development of digital products vary from institution to institution. The most common objective cited was improved access through digitizing federal information collections. Other objectives are shown in Figure 3 in order of importance. The percentages indicate the frequency the particular objective was listed in the top three by respondents.



The top five challenges facing institutions with respect to the planning and development of digital products also varied from institution to institution. The most commonly reported challenge was technical limitations, followed by budgetary constraints, copyright considerations, lack of policy guidelines, and the selection of materials for digitization (see Figure 4). The percentages indicate the frequency the challenge was listed in the top three by respondents.



3. Costs of Digitization

An awareness of the costs associated with digitization products is a key factor in any planning initiative. Knowing the costs of digitization allows institutions to make better-informed decisions with respect to the selection of materials for digitization and for budgetary planning.

Human Resource Time Allocated to Digitization Activities Annually (Figure 5)

Less than 1 FTE	19%
1-5 FTEs	17%
More than 5 FTEs	17%
Information not available	46%

Figure 5 shows the human resource time allocated annually (measured in terms of full-time equivalents [FTEs]) to digitization activities by the institutions surveyed. The human resource complement varied significantly from institution to institution. The reported number of FTEs per year ranged from as low as 0.05 to as high as 125.

Annual Expenditure on Digitization Activities (Figure 6)

Less than \$100,000	33%
\$100,000 - \$1,000,000	17%
More than \$1,000,000	10%
Information not available	39%

Figure 6 represents the total dollar amount spent annually on digitization activities. The total cost per year varied from \$450 to \$12,000,000.

A note of caution is necessary. Before any conclusions can be drawn, more detailed data should be obtained for further analysis. The average costs of digital products can only be determined by comparing similar products. In addition, the high percentage of incomplete responses prevents any accurate analysis of these results.

B. Nature of Digital Content

In order to assess the nature of federal digital content, institutions were asked specific questions pertaining to each of their digital products. The results below represent the findings from 165 digital products. For the purposes of the survey, digital products were defined as:

...a common grouping of digitized information, developed and/or acquired by a government institution for a specific purpose. Examples include a collection of literature or a collection of digitized holdings. Inter-office and administrative correspondence are excluded from this definition.

1. Audience

Digitization presents the opportunity to enhance access to federal information throughout Canada. Given this potential, it is not surprising that the most commonly reported intended audience for digital products is the general public. The second most commonly reported intended audience is the federal government, followed by educational organizations, the private sector, provincial governments, international governments and other specific audiences (see Figure 7). The percentages indicate the frequency the intended audience was listed by the respondents.

Top Seven Intended Audiences (Figure 7)

1. General public (64%)
2. Federal government (60%)
3. Educational organizations (50%)
4. Private sector (47%)
5. Provincial governments (41%)
6. International governments (31%)
7. Other specific audiences (28%)

2. Purpose of Digital Products

The purpose for the creation of digital products varied from institution to institution. The most commonly reported purpose for the creation of a digital product was general public interest. Other purposes are shown in Figure 8 in order of frequency the purpose was listed by the respondents.

Purpose for the Digital Product (Figure 8)

1. General public interest (65%)
2. Preservation (27%)
3. Revenue generation (23%)
4. Exhibition (20%)

3. Content of Digital Products

The content of digital products varied substantially from product to product and seemed to coincide with the mandate of the particular institution. Customized products for

specific audiences was the most commonly reported content type, as shown in Figure 9. Other types of content ranged from departmental information to technological information. The percentages indicate the frequency the content was listed by the respondents.

Top Five Contents of Digital Products (Figure 9)

1. Customized products for specific audiences (55%)
2. Departmental information (45%)
3. Historical information (38%)
4. Scientific information (23%)
5. Technological information (22%)

4. Types of Information Being Digitized

Digitization makes it possible to capture a wide array of information types and present them in the most appropriate digital format. The results of the survey show that federal institutions are taking advantage of these opportunities by digitizing a variety of information types, with text being the most common (see Figure 10). The percentages indicate the frequency the type of information was listed by the respondents.

Top Eight Types of Information Being Digitized (Figure 10)

1. Text (86%)
2. Photographs (44%)
3. Graphics (15%)
4. Sound (12%)
5. Video (12%)
6. Artifacts (9%)
7. Film (3%)
8. Broadcasts (1%)

5. Information Provided Only in Digital Format

Of the 165 products, 37 percent are only provided in digital format. The remaining 63 percent are provided in conventional as well as in digital forms.

It is likely that in the future federal information holdings and collections may only be available in digital form. This may be a cause for concern, given that not all Canadians have knowledge of and access to information technology. Therefore, the provision of information exclusively in digital format may limit access to federal information.

6. Digital Standards

The percentages indicate the frequency the particular digital standard was listed by respondents.

i. Mark-Up Languages for the Development of Digital Products

The study of mark-up languages used for the development of digital products is an important concern for digitization planning, since the mark-up language can

significantly affect the usability and interoperability of digital products. For each type of digital product surveyed, there are some widely used standards as well as a significant number of "other" responses that are representative of a plethora of standards. This plethora of standards makes it increasingly difficult to determine which mark-up languages are most appropriate to meet the goals and objectives of a particular project. In light of these results, the need for a standards framework for digital products is evident to ensure usability and interoperability.

Text-Based Languages Used (Figure 11)

.html	49%
.pdf	18%
.txt	16%
Other	17%

Almost half of text-based digital products were developed in .html, 18 percent were developed in .pdf, 16 percent were developed in .txt, and the remainder were developed in other languages, such as PostScript, WordPerfect, .sgml, and Microsoft Word (see Figure 11).

Image-Based Languages Used (Figure 12)

.gif	32%
.tif	26%
.jpg	25%
Other	17%

Figure 12 illustrates the languages used for the development of image-based products. About one-third of image-based products were developed in .gif. About one-quarter of the products were developed in .tif, and another quarter were developed in .jpg. The remainder of image-based products were developed in other languages.

Sound-Based Products Used (Figure 13)

.wav	41%
.ra	19%
Other	19%
.au	9%
.aiff	6%
.mid	6%

For sound-based products, 41 percent were developed with .wav, 19 percent with .ra, 9 percent with .au, 6 percent with .mid and 6 percent with .aiff. The remaining 19 percent were developed with other sound-based products (see Figure 13).

Multimedia-Based Languages Used (Figure 14)

.mpeg	31%
Other	28%
.mov	24%
.avi	17%

For multimedia-based products, 31 percent were developed with .mpeg, 24 percent with .mov, 17 percent with .avi and the remaining 28 percent with other multimedia-based languages (see Figure 14).

ii. **Resolution for Image-Based Products**

Figure 15 shows the percentage use of various resolutions for image-based products. By far the most commonly used resolution is 300 dpi at 58 percent, followed by 600 dpi at 27 percent, then 1200 dpi at 13 percent.

Resolution Used for Image-Based Products (Figure 15)

300 dpi	58%
600 dpi	27%
1200 dpi	13%
Other	2%

iii. **Navigational and Search Tools**

Figure 16 displays the types of navigational or search tools being used. The most commonly used navigational or search tool is an Internet browser at 24 percent, followed by .html tags at 4 percent and glimpse at 3 percent.

Navigational or Search Tools Used (Figure 16)

Other (mix of tools)	35%
Not specified	34%
Internet browser	24%
html tags	4%
glimpse	3%

7. **Digital Formats**

An awareness of the formats in which digital information is available is an important consideration in the digitization of federal information. The format chosen affects the accessibility of a digital product, since certain formats require access to more sophisticated information technology as well as skills to use the technology.

The most commonly used format for disseminating digital information is the Internet, followed by CD-ROM, diskette and dial-up service (see Figure 17).

Digital Formats (Figure 17)

1. Internet
2. CD-ROM
3. Diskette
4. Dial-up service
5. Other

8. Longevity of the Digital Product

Information on the longevity and the maintenance required for digital products is key to the planning and costing of digitization projects.

Figure 18 shows the number of years products will be available. The majority of digitization products (66 percent) need to be continually updated for an indefinite period of time.

Number of Years Project Will Be Available (Figure 18)

Less than 5 years	6%
5 years or more	2%
Indefinitely	66%
Information not available	26%

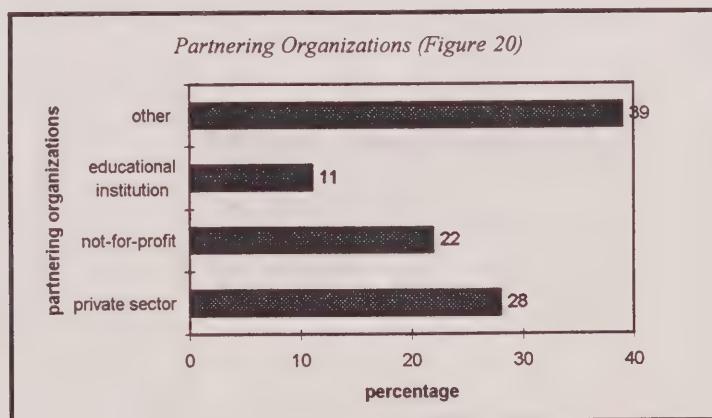
The survey results indicate that of the 165 products, 76 percent will be continually updated through ongoing maintenance, while 24 percent will not be updated.

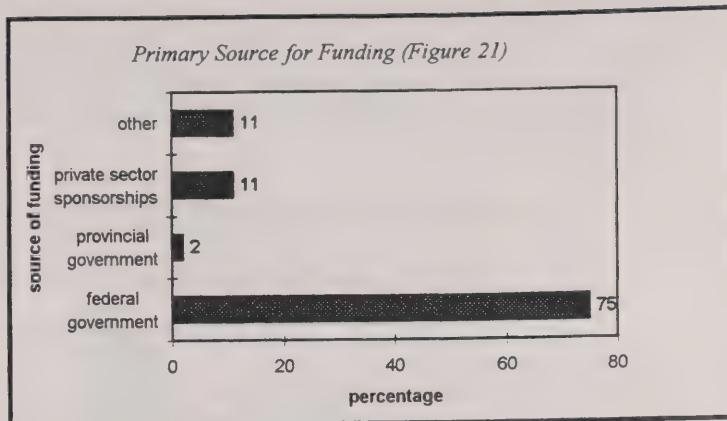
C. Partnerships and Funding Arrangements

Figure 19 shows that only 25 percent of survey respondents are involved in digitization partnership agreements. Since partnerships may facilitate the digitization of federal holdings as well as stimulate economic growth, the use of partnership arrangements may be a viable option for more institutions.



Of the federal institutions involved in partnership arrangements, 28 percent are partnering with the private sector, 22 percent with not-for-profit organizations, 11 percent with educational organizations and 39 percent with other types of organizations (see Figure 20). These other organizations are primarily government.





The results here show that of the institutions not involved in partnership agreements, 75 percent reported the primary source for funding of digital products as the federal government (see Figure 21).

D. Digitization Plans and Priorities

Federal institutions have vast collections and information holdings, but have limited resources for the digitization of this information. Having clearly defined criteria for the selection of projects for digitization can be of great assistance for departments, agencies and Crown corporations.

The most commonly cited criterion for the selection of digitization products is the mandate to communicate widely (see Figure 22). The second most reported criterion for selection is usefulness of the digitized product as a research tool, followed by educational significance, outreach and the promotion of socio-cultural equality (to provide access to socially disadvantaged groups).

Criteria for Selection (Figure 22)

1. Mandate to communicate widely (68%)
2. Usefulness as a research tool (65%)
3. Educational significance (49%)
4. Outreach (41%)
5. Promote socio-cultural equality (29%)

Exhibit 1

List of Survey Respondents

Agriculture and Agri-Food Canada	International Development Research Centre
Atlantic Canada Opportunities Agency	Justice Canada, Department of
Atomic Energy Control Board	Library of Parliament
Business Development Bank of Canada	Medical Research Council of Canada
Canada Council of the Arts	National Archives of Canada
Canada Labour Relations Board	National Energy Board
Canada Mortgage and Housing Corporation	National Film Board of Canada
Canadian Artists and Producers Professional Relations Tribunal	National Gallery of Canada
Canadian Centre for Management Development	National Library of Canada
Canadian Heritage	National Research Council of Canada
Canadian Human Rights Commission	Natural Resources Canada
Canadian Intergovernmental Conference Secretariat	Natural Sciences and Engineering Research Council of Canada
Canadian International Trade Tribunal	North American Free Trade Agreement Secretariat
Canadian Museum of Civilization Corporation	Office of the Auditor General of Canada
Canadian Museum of Nature	Office of the Information Commissioner of Canada
Canadian Radio-television and Telecommunications Commission	Patented Medicine Prices Review Board
Canadian Security Intelligence Service	Privacy Commissioner of Canada
Canadian Space Agency	Privy Council Office
Canadian Transportation Agency	Public Service Staff Relations Board
Civil Aviation Tribunal	Public Works and Government Services Canada
Competition Tribunal	Revenue Canada
Copyright Board Canada	Royal Canadian Mounted Police
Elections Canada	Royal Canadian Mounted Police Public Complaints Commission
Emergency Preparedness Canada	Security Intelligence Review Committee
Environment Canada	Social Sciences and Humanities Research Council of Canada
Federal Court of Canada	Solicitor General of Canada
Federal Judicial Affairs	Statistics Canada
Finance Canada, Department of	Status of Women Canada
Foreign Affairs and International Trade	Supreme Court of Canada
Government House	Tax Court of Canada
Hazardous Materials Information Review Board	Transport Canada
Health Canada	Treasury Board of Canada Secretariat
Human Resources Development Canada	Veterans Affairs Canada
Indian and Northern Affairs Canada	
Industry Canada	

Exhibit 2

Digitization Survey - Administered June 1997 **Digitization Activities, Plans and Priorities within Federal Departments and Agencies**

Introduction:

The following survey has been developed to determine more comprehensively the extent of digitization activities within the Federal government.

Consistent with the mandate of the Task Force, the focus of this survey is limited to Federal government collections and information holdings. At present, little work has been done towards the development of an inventory in this area, however, comprehensive knowledge of departmental and agency activities, priorities and best practices is critical to any further investigation, policy analysis or policy development in the field of digitization. We therefore appreciate your co-operation in completing this survey.

We request that the survey be completed and returned to the Secretariat, **no later than July 15, 1997**. Should you have any questions or concerns regarding this survey, please telephone Dodie Sobretodo at the Digitization Task Force Secretariat at (613) 996-3817.

For the purpose of this survey, the following definitions of key terms are used:

Digitize:

(1) To express or represent in a digital form data that are not discrete data, for example, to obtain a digital representation of the magnitude of a physical quantity from an analogue representation of that magnitude. (2) To convert an analogue signal into digital format. An analogue signal during conversion must be sampled at discrete points and quantized to discrete numbers. (Wood John et George McDaniel, eds., Dictionnaire d'informatique anglais - français. Montreal: IBM Canada Ltd., 1994. P. 181)

Digitization:

The conversion of text, sound, images, video and other content into a common digitized format. (Information Highway Advisory Council. Connection Community Content: The Challenge of the Information Highway: Final Report of the Information Highway Advisory Council. Ottawa: Minister of Supply and Services, 1995. P. 3)

Converting material into digital form. (Keenan, Stella. Concise Dictionary of Library and Information Science. West Sussex: Bowker-Saur, 1996. P. 79)

Digital Product:

For the purposes of this survey, digital product refers to a common grouping of digitized information, developed and/or acquired by a government institution for a specific purpose. Examples include a collection of literature or a collection of digitized holdings. Inter-office and administrative correspondence are excluded from this definition.

A. Your Organization's Approach to Digitization

1. Does your organization have in place an explicit policy with respect to the digitization of your scientific and/or cultural holdings?
 yes
 no
2. If yes, please describe the digitization policy's objectives or attach supporting documentation if it is available.

3. If no policy is currently in place, is your organization working to develop one?
 yes
 no
4. Please describe the top three **challenges** facing your organization with respect to the planning and/or development of digital products.
 - i. _____
 - ii. _____
 - iii. _____
5. Have any policy reviews, program evaluations etc. been conducted by your organization to assess the effectiveness of your departments' approach to digitization? (*If so, please attach supporting documentation or identify where it is available.*)
 yes
 no

6. Please describe the top three **objectives** in your organization with respect to the planning and/or development of digitization products.

i. _____

ii. _____

iii. _____

7. What is the total amount, in dollars, spent annually on digitization activities in your organization?

8. What is the total, in human resource time, spent annually on digitization activities in your organization?

B. Nature of Your Organization's Digital Content

For each digital product developed by your organization, please respond to the following (*where more than one product exists, please duplicate this section and attach*).

1. What is the digital product?

2. Who is the intended audience for this product?

- federal government
- provincial government
- international governments
- educational institutions
- private sector
- general public
- other (*please specify*) _____

3. For what purpose was this digital product created? (*where more than one purpose exists, please indicate, and identify the priority ranking of these purposes (1=highest, 5=lowest)*).

- for revenue generation purposes
- for exhibition
- for general public interest (educational, recreational etc.)
- for reasons of preservation
- other (*please specify*) _____

4. Please describe the nature of the content:

- historical information
- scientific information
- technological information
- artistic information
- public administration/political information
- other (*please specify*) _____

5. What types of information are being digitized?

- text
- sound
- photographs
- video
- film
- artifacts
- broadcasts
- other (*please specify*) _____

6. Will this information only be provided in digital format?

- yes
- no

7. Is the digital product intended to represent a sample of a larger body of material, or is it a representation of an entire body of material?

- sample
- entire body of material

8. What language was used to develop this product?

- i. For text based products:
 - .html
 - .sgml
 - .pdf
 - .txt
 - postscript
 - other (*please specify*) _____
- ii. For image based products:
 - .gif
 - .jpg
 - .tif
 - other (*please specify*) _____
- iii. For sound based products:
 - .wav
 - .mid
 - .ra
 - .au
 - other (*please specify*) _____
- iv. For multimedia based products:
 - .avi
 - .mpeg
 - .inor
 - .mov
 - .wrl
 - other (*please specify*) _____

9. In the case of image based products, what resolution was used?

- 300 dpi
- 600 dpi
- 1200 dpi
- other (*please specify*) _____

10. How is the digital information accessible?

- internet
- CD rom
- diskette
- dial up service
- other (*please specify*) _____

11. What types of navigational or search tools are being used?

12. Does this digital project need to be continually updated?

- yes
- no

13. How long do you plan to keep this digital product available?

14. What is the total amount, in dollars, spent on this digital product?

15. What is the total human resources time, spent on this digital product?

C. Partnerships and Funding Arrangements

1. Are the digitized products comprised of your organization's own holdings or have agreements been put in place to partner with other institutions in order to digitize some of their holdings?

- own organization's holdings
- agreements exist with other institution(s) (*please specify institution(s)*) _____

- combination of both

2. If partnership agreements are in place, please answer the following questions on the organization with which you are partnering:

i. With what type of organization are you partnering?

- private sector
- not-for-profit
- educational institution
- other (*please specify*)

ii. Has your partner provided you with funding?

- yes
- no

iii. If yes, is your organization responsible for supplementing these funds?

- yes
- no

iv. Has your partner provided you with content for digitizing?

- yes
- no

v. If yes, have digital rights been cleared for use of this content?

- yes
- no
- n/a

3. Where partnerships are not the source of funding, what is the primary source of funding for the development of these digital products?

- federal government funding
- provincial government funding
- private sector sponsorships
- other (*please specify*)

D. Digitization Plans & Priorities

1. Please rank, in order of importance (*1=highest, 5=lowest*), the criteria used by your organization in selecting material for digitization:

- revenue generation potential
- educational significance
- potential of material to promote social-cultural equality (*i.e. among socially disadvantaged groups*)
- potential of material to promote citizenship & national pride
- usefulness of material as a research tool
- outreach
- mandate to communicate widely
- other (*please specify*)

2. How many digitization products is your organization currently planning for development from:

- i. present to the end of 1998? _____
- ii. 1999 to the end of 2001? _____

3. Please identify your organization's top three (3) planned priorities for digitization and identify the reasons for their priority status:

i. _____

Reason: _____

ii. _____

Reason: _____

iii. _____

Reason: _____

4. Please provide any additional comments:

5. Please indicate the name, address, telephone number and e-mail of a contact person from your organization, in order that follow-up may be carried out, if necessary.

Name: _____

Position: _____

Address: _____

_____ *Postal Code* _____

Telephone: _____ *Fax:* _____

E mail: _____

**Digitization Survey
Digitization Activities, Plans and Priorities within Federal Departments and Agencies**

We are forwarding the Survey to you because you were identified as one of the principal contacts responsible for information management. In some cases, copies of the survey have been sent to others within your organization.

We trust that you will coordinate and consolidate your responses so that the digitization activities within your organization are accurately reflected. The Survey is also posted at our Web site for your convenience. The address is: <http://www.nrc.ca/dtf-gtn>. The Survey username is "public" and the password is "form!". We strongly recommend that you complete the Survey on the Web site.

We look forward to receiving your completed responses by July 15, 1997. We hope that the results of the Survey will be an important first step towards the development of a federal strategy on digitization.

For information on the Survey or assistance in completing the Survey, please contact Dodie Sobretodo at the Digitization Task Force Secretariat.

Should you choose to fill out the paper copy, please forward your completed Survey to:

Dodie Sobretodo, Advisor
Digitization Task Force Secretariat
215 - 395 Wellington Street
Ottawa, Ontario, K1A 0N4

Telephone: (613) 996-3817

Fax: (613) 996-7941

Web site: <http://www.nrc.ca/dtf-gtn/english/index.htm>

E-mail: dodie.sobretodo@nlc-bnc.ca

Thank you for your participation in this important initiative.

Annex 3: Quick Reference to Selected Relevant Federal Information Legislation and Policies

LEGISLATION

Legislation	Description
<i>Access to Information Act</i> R.S.C. 1985, c. A-1	<ul style="list-style-type: none"> Provides Canadians with a right of access to records held or controlled by government "in accordance with the principles that government information should be available to the public [and] that necessary exceptions to the right of access should be limited and specific". It is "intended to complement and not replace existing procedures for access to government information".
<i>Broadcasting Act</i> R.S.C. 1985, c. B-9	<ul style="list-style-type: none"> Provides the legislative framework for regulation of the Canadian broadcasting system by the Canadian Radio-television and Telecommunications Commission (CRTC). Outlines the Broadcasting Policy for Canada.
<i>Canada Evidence Act</i> R.S.C. 1985, c. C-5	<ul style="list-style-type: none"> Applies to all criminal proceedings and to all civil proceedings and other matters of proceedings over which Parliament has jurisdiction. Every copy of an act of Parliament printed by the Queen's Printer shall be deemed to be so printed unless the contrary is shown (s. 19).
<i>Canadian Charter of Rights and Freedoms</i> R.S.C. 1985, Appendix II, No. 44	<ul style="list-style-type: none"> The Act sets out basic rights and freedoms. According to s. 18, all statutes, records and journals of Parliament shall be printed in both official languages. S. 20 states that any member of the Canadian public has the right to communicate with and receive available services from the federal government in English or French within reason, so long as there is a significant demand in such language. The Charter is to be interpreted in a manner consistent with the preservation and enhancement of the multicultural heritage of Canadians.
<i>Canadian Heritage Languages Institute Act</i> S.C. 1991, c. 7 (Not in Force)	<ul style="list-style-type: none"> Provides for the establishment of the Canadian Heritage Languages Institute, whose purpose is to promote languages other than the official languages that contribute to the linguistic heritage of Canada.
<i>Canadian Multiculturalism Act</i> R.S.C. 1985, c. 24 (4th Supp.)	<ul style="list-style-type: none"> An Act for the preservation and enhancement of multiculturalism in Canada.
<i>Canadian Radio-television and Telecommunications Commission Act</i> R.S.C. 1985, c. C-22	<ul style="list-style-type: none"> Provides for the establishment and constitution of the Canadian Radio-television and Telecommunications Commission.
<i>Copyright Act</i> R.S.C. 1985, c. C-42	<ul style="list-style-type: none"> Sets out rights which attach to literary, artistic, dramatical and musical works, to sound recordings, to performers' performances and to broadcast signals. It also sets out a number of limited exemptions to these rights. Recent changes to the <i>Copyright Act</i> (Bill C-32) will have a number of impacts on the accessibility of Canadian heritage materials for digitization projects. The revisions have clarified rights and exceptions, and by introducing a term of protection for unpublished works, will make a wealth of records now held in archives and other heritage and cultural institutions available for use in the creation of new digital products once the five-year transition phase has passed.

<i>Cultural Property Export and Import Act</i> R.S.C. 1985, c. C-51	<ul style="list-style-type: none"> An Act respecting the export from Canada of cultural property and the import into Canada of cultural property illegally exported.
<i>Department of Public Works and Government Services Act</i> S.C. 1996, c. 16	<ul style="list-style-type: none"> Governs procurement activities, including those related to communications. Prescribes the role of the Queen's Printer as the sole government publisher and forms the basis for the provision of associated communications services and establishment of the Canada Communications Group (CCG). Upon privatization of CCG, the Queen's Printer services have been retained in Public Works and Government Services Canada (PWGSC). The Minister of Public Works and Government Services Canada provides departments and agencies with video and cinematographic works within the meaning defined by the <i>National Film Act</i>.
<i>Financial Administration Act</i> R.S.C. 1985, c. F-11	<ul style="list-style-type: none"> Defines the roles and responsibilities of the Treasury Board. The Treasury Board may act for the Privy Council in all matters relating to general administrative policy in the public service of Canada, financial management, and the review of annual and longer-term expenditure plans and programs of various departments of government and the determination of priorities with respect thereto (s. 7(1)). Defines and lists relevant "departments" and "departmental corporations" for the purposes of the Act.
<i>The National Archives Act</i> R.S.C. 1985, c. N-2	<ul style="list-style-type: none"> Provides for the establishment of the National Archives of Canada, whose objects and functions are to conserve private and public records of national significance and facilitate access thereto, to be the permanent repository of records of government institutions and of ministerial records, to facilitate the management of records of government institutions and of ministerial records, and to encourage archival activities and the archival community.
<i>The National Arts Centre Act</i> R.S.C. 1985, c. N-3	<ul style="list-style-type: none"> An Act to establish a corporation whose objects are to operate and maintain the National Arts Centre, to develop the performing arts in the National Capital Region and to assist the Canada Council in the development of the performing arts elsewhere.
<i>National Film Act</i> R.S.C. 1985, c. N-8	<ul style="list-style-type: none"> An Act to establish a National Film Board whose purpose is to initiate and promote the production and distribution of films in the national interest.
<i>The National Library Act</i> R.S.C. 1985, c. N-12	<ul style="list-style-type: none"> The powers and duties of the National Librarian are to manage and direct the Library in such a manner that the facilities of the Library may be made available to the Government and people of Canada to the greatest extent consistent with the sound administration of the Library. Preserves Canada's published heritage through legal deposit of publications including federal publications.
<i>Official Languages Act</i> R.S.C. 1985, c. 31 (4th Supp.)	<ul style="list-style-type: none"> The purpose of this Act is to ensure respect for English and French as the official languages of Canada and to enhance the use of the English and French languages within Canadian society.
<i>Parliament of Canada Act</i> R.S.C. 1985, c. P-1	<ul style="list-style-type: none"> Part V of this Act states that all books, paintings, maps and other articles that are in the joint possession of the Senate and House of Commons are vested in the Crown.
<i>Privacy Act</i> R.S.C. 1985, c. P-21	<ul style="list-style-type: none"> The purpose of this Act is to extend the present laws of Canada that protect the privacy of individuals with respect to personal information about themselves held by a government institution and that provide individuals with a right of access to that information.
<i>Publication of Statutes Act</i> R.S.C. 1985, c. S-21	<ul style="list-style-type: none"> This Act applies to the printing and distribution of all Acts of Parliament.

<i>Statistics Act</i> R.S.C. 1985, c. S-19	<ul style="list-style-type: none"> The duties of Statistics Canada are to collect, compile, analyze, abstract and publish statistical information relating to commercial, industrial, financial, social, economic and general activities and conditions of Canadians, and the activities of federal departments.
<i>Status of the Artist Act</i> S.C. 1992, c. 33	<ul style="list-style-type: none"> An Act respecting the status of the artist and professional relations between artists and producers in Canada.
<i>Statute Revision Act</i> R.S.C. 1985, c. S-20	<ul style="list-style-type: none"> The Statute Revision Commission and the Minister of Justice issue the Revised Statutes and Regulations of Canada pursuant to the <i>Statute Revision Act</i>.
<i>Statutory Instruments Act</i> R.S.C. 1985, c. S-22	<ul style="list-style-type: none"> An Act to provide for the examination, publication and scrutiny of regulations and other statutory instruments. Provides authority for production of the <i>Canada Gazette</i>.
<i>Telecommunications Act</i> S.C. 1993, c. 38	<p>Outlines the Canadian Telecommunications Policy which states that telecommunications performs an essential role in the maintenance of Canada's identity and sovereignty and that the objectives of the policy are:</p> <ul style="list-style-type: none"> to facilitate the development of a telecommunications system that safeguards and enriches and strengthens the social and economic fabric of Canada; to render reliable, affordable, high-quality and accessible telecommunications services; to enhance the efficiency and competitiveness of Canadian telecommunications; to promote ownership and control of Canadian carriers by Canadians; to promote the use of Canadian transmission facilities; to foster increased reliance on market forces for the provision of telecommunications services and to ensure that regulation, where required, is efficient and effective; to stimulate research and development in telecommunications; to respond to economic and social requirements of users; and to contribute to the protection of the privacy of persons.

POLICIES

Policies	Description
Common Services Policy	<ul style="list-style-type: none"> Outlines mandatory and optional communications and publishing services.
Communications Policy (in effect 1988)	<ul style="list-style-type: none"> Issued pursuant to the <i>Financial Administration Act</i>, for which the President of the Treasury Board and Treasury Board Ministers are responsible. The Chief Information Officer Branch is responsible for the implementation of policies. The Privy Council Office assumes a leading role in communications policy development due to the sensitive nature of communications functions and the need to provide a link to the Cabinet decision-making process. <p>The principles underlying the government's responsibility to disseminate information to Canadians are outlined in the federal Communications Policy:</p> <ul style="list-style-type: none"> "The responsibility to provide information is inseparable from the nature of representative government." "Adequate information is essential in order that the public may understand, respond to and influence the development and implementation of government policies and programs." "Good communications is fundamental to the achievement of government objectives." <p>The policy promotes three core propositions:</p> <ul style="list-style-type: none"> "to provide information to the public about [government] policies, programs and services that is accurate, complete, objective, timely, relevant, and understandable"; "to take into account the concerns and views of the public in establishing priorities, developing policies and implementing programs"; and "to ensure that the government is visible, accessible and answerable to the public that it serves". <p>Contains guidelines regarding information for which the government would not charge. This includes information when it:</p> <ul style="list-style-type: none"> is needed by individuals to make use of a service or program for which they may be eligible; is required for public understanding of a major new priority, law, policy, program or service; explains the rights, entitlements and obligations of individuals; and informs the public about dangers to health, safety or the environment.

Cost-Recovery & Charging Policy	<ul style="list-style-type: none"> • Sets out the guiding principles for cost recovery and charging activities of departments and agencies. • Emphasizes the need for participatory consultation between departments and agencies and participatory consultation between departments, agencies and their client. <p>The aim of the policy is:</p> <ul style="list-style-type: none"> • to promote the efficient allocation of resources; • to promote an equitable approach to financing government programs, by fairly charging clients or beneficiaries beyond those enjoyed by the general public; and • to earn a fair return for the Canadian public for access to, or exploitation of, publicly owned or controlled resources.
Contracting Policy	<ul style="list-style-type: none"> • Provides the framework for contracting for communications services, notably those related to Advertising and Public Opinion Research. • The Privileged Administrative Arrangement (PAA) is issued under the authority of this policy.
Depository Services Program	<ul style="list-style-type: none"> • A network of libraries in communities across Canada, and around the world, that provide no-cost access to Canadian federal documents in all forms and formats. • A cost-effective way for the federal government, its departments and agencies to ensure public access to federal information in environments where they are fully supported and serviced. • In exchange for complimentary access to federal publications in both hard and virtual form, depository institutions undertake at no cost to the government or user to catalogue, house, make accessible and maintain these items, and to provide the specialist expertise and tools needed for users to effectively make use of them.
The Federal Identity Program	<p>The objectives are:</p> <ul style="list-style-type: none"> • to enable the public to recognize clearly federal activities by means of consistent identification; • to improve service to the public by facilitating access to federal programs and services; • to project equality of status of the two official languages consistent with the Canadian Charter of Rights and Freedoms and the <i>Official Languages Act</i>; • to ensure effective management of the federal identity consistent with government-wide priorities; • to achieve savings through standardization; and • to promote good management practices in the field of corporate identity and information design.
Government of Canada Internet Guide	<p>This guide provides guidance to federal government departments on the use of the Internet. It covers four main subjects:</p> <ul style="list-style-type: none"> • Understanding the Internet • Laying the Groundwork • Building the Site • Other Considerations (applicable government-wide legislation and policies, etc.)

Government Security Policy	<ul style="list-style-type: none"> The objective is to ensure the appropriate safeguarding of all sensitive information and assets of the federal government.
How to Provide Alternative Formats	<p>A practical guide for federal departments and agencies designed to:</p> <ul style="list-style-type: none"> assist in providing alternative formats; and provide a reference tool to familiarize departments and agencies with the communications needs of people with visual and hearing disabilities, and to meet those needs.
Management of Government Information Holdings	<ul style="list-style-type: none"> The objective is to ensure the cost-effective and coordinated management of federal information holdings.
Management of Information Technology	<ul style="list-style-type: none"> The objective of the policy is to ensure that information technology is used as a strategic tool to support government priorities and program delivery, to increase productivity, and to enhance service to the public. <p>The aim of the policy is to:</p> <ul style="list-style-type: none"> promote the use of information technology in renewing the way the government does its business, and to maintain a technologically adept and modern public service; coordinate, and set overall directions for, government information technology; and use a business-case approach to develop information technology strategies based on program priorities, and to select and approve government information technology investments that best meet the policy objective and show due regard for employees and members of the public.
The Preservation of Essential Records: A guide for governments, organizations, institutions and businesses	<ul style="list-style-type: none"> This guide provides a brief introduction to the concept of essential records and gives basic guidelines on establishing an essential records program within the context of emergency preparedness and business resumption planning.
Treasury Board Information Technology Standards (TBITS)	<ul style="list-style-type: none"> The Government of Canada's official documents for promulgating new and revised TBITS and for communicating guidelines, technical reports and standard operating practices adopted and promulgated under the TB's Information Management policies. Support the Treasury Board Secretariat's information management responsibilities for leadership, technical guidance and coordination of the standardization activities of the Government of Canada.

Annex 4: Selected Standards in the Digitization Process

This list is not comprehensive and provides only a snapshot of a subset of the many standards that departments involved in digitization and information management will encounter. In many cases, there are significant variations even within the standards, for example between different versions of MS Word, compression formats used in TIFF, or the extensions to Internet mail. Some of these are de facto standards, others are de jure, while still others are significant marketplace standards.

Some categories of standards have not been included in areas such as colour information interchange, storage (e.g., CD-ROM/DVD), application protocol interfaces (APIs), commerce/EDI, data protection, encryption, authorization, authentication, groupware and collaboration, and the various hybrids and extensions that surround all of the below categories and standards. There are many emerging media formats for compound documents and maintaining complex relationships between digital objects, as well as new computing languages that also have not been mentioned.

OSI and Internet Data Transfer Standards

- Transport Control Protocol/Internet Protocol (TCP/IP)
- Telnet
- File Transfer Protocol (FTP)
- File Transfer, Access and Management (FTAM - OSI)
- Gopher
- Hypertext Transfer Protocol (HTTP)
- Multimedia Internet Mail Extensions (MIME)
- Simple Mail Transfer Protocol (SMTP)
- X.400 Mail (OSI)
- Machine Readable Cataloguing (MARC) standards

Character Set Standards

- ASCII (American Standard Code for Information Interchange) (ISO 641)
- ISO Latin 1 (ISO 8859-1:1987 part 1)
- UNICODE (ISO 10646-1 Universal Character Set)

Document Interchange Standards

- ASCII
- Rich Text Format (RTF)
- Word-processing Formats (examples: MS Word, WordPerfect, Wordstar)
- Desktop Publishing Formats (examples: PageMaker, Ventura, QuarkExpress)
- Structured Formats (examples: SGML, HTML, XML)

- Page Description Formats (examples: LaTeX/TeX, PostScript, PDF)

Audio Interchange Standards

- Audio Interchange File Format (AIFF)
- mLaw (AU: Sun format)
- WAVE (WAV: Microsoft)
- RealAudio (RA)

Image Interchange Standards

- CCITT Group 4 Fax
- Computer Graphics Metafile (CGM)
- Graphic Interchange Format (GIF)
- Joint Photographic Experts Group (JPEG)
- PhotoCD
- Portable Network Graphics (PNG)
- Tagged Image File Format (TIFF)

Moving Image and Multimedia Standards

- Audio-Video Interleaved (AVI)
- Graphic Interchange Format (GIF) 89a (animated GIF)
- Motion Picture Experts Group (MPEG)
- QuickTime (MOV)
- Realvideo
- Shockwave

3-Dimensional Standards

- Virtual Reality Modeling Language (VRML)
- QuickTime Virtual Reality

Data Streaming Standards

- Real Time Streaming Protocol (RTSP)
- NetShow Standard

Navigation and Retrieval Standards

- Common Indexing Protocol
- Z39.50: ANSI/NISO Information Retrieval Standard
- Z39.59: ANSI/NISO Common Command Language Standard
- ISO 10160/10161 Interlibrary Loan Protocol

- Structured Query Language (SQL)

Directory Standards

- ISO 9594 Directory Standard
- LDAP: Lightweight Directory Access Protocol
- WHOIS, WHOIS++

Metadata Standards

- Dublin Core/Warwick Framework
- Encoded Archival Description (EAD) (SGML DTD)
- Government Information Locator Service (GILS)
- Meta Content Framework (MCF)
- Platform for Internet Content Selection (PICS)
- Summary Object Interchange Format (SOIF)
- Text Encoding Initiative (TEI) headers (SGML DTD)
- Uniform Resource Characteristics (URC)

Locator Standards

- International Standard Bibliographic Number (ISBN)
- International Standard Serial Number (ISSN)
- Uniform Resource Locators (URL)
- Persistent Uniform Resource Locators (PURL)
- ANSI/NISO Z39.56-1996 Version 2 SICI: Serial Item and Contribution Identifier
- Uniform Resource Names (URN)

Annex 5: List of Task Force, Advisory Groups, and Secretariat Members

TASK FORCE MEMBERS

<i>Marianne Scott (Co-Chair)</i>	National Librarian National Library of Canada
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	Director, Technical Services Information Management Branch Natural Resources Canada
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<i>Bob Huck</i>	Executive Vice-President Industry Canada
<i>Erle Jones</i>	Director, Network Technologies Research Communications Research Centre Industry Canada
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Issue 5 - Funding Strategies for Digital Conversion

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Havelin Anand

Executive Director
Federal Task Force on Digitization

Carmen Abela

Advisor (April/May '97)

Jane Karhi

Advisor

Dodie Sobretodo

Advisor (May - Sept. '97)

Diane Radmore

Administrative Officer

Annex 6: Glossary of Terms

<i>Data capture</i>	involves the manual data entry (word processing), optical character recognition (OCR), imaging or recording required to convert the resource into digital form. Different media require different media standards for their capture.
<i>Data processing</i>	may be required to ensure the digital resource is suitable for storage, display or retrieval. For example, text may require conversion of special characters or close editing, images and sounds may need enhancement, amplification or compression, or a collection of numeric data may need to be structured for entry into a database.
<i>Digitization</i>	refers to the process of translating a piece of information such as a book, sound recording, picture or video into bits. This digitization process can be accomplished through a variety of existing technologies, and may comprise any or all of the following steps:
	<ol style="list-style-type: none">1. <i>creation</i>: the making of digital copies of analogue objects or the modification of original digital objects for purposes of dissemination;2. <i>dissemination</i>: the provision of mechanisms by which the target population of users can gain access to the digitized material in the collection; and3. <i>organization</i>: the provision of search tools and finding aids for the user to access the collection of digitized or conventional objects effectively.
<i>Encryption</i>	the coding of data for privacy protection or security considerations when transmitted over telecommunications links, so that only the person to whom it is sent can read it.
<i>Information holdings</i>	includes all information under the control of a government institution, regardless of physical mode or medium in which such information may be stored. Without restricting the generality of the foregoing, this may include correspondence, memoranda, books, plans, maps, drawings, diagrams, pictorial or graphic works, photographs, films, microforms, sound recordings, videotapes, machine readable records, published material, and any other documentary material. Excluded from the definition are materials held by federal libraries which were not prepared or produced by or for the government.

<i>Internet</i>	a vast international network of networks that enables computers of all kinds to share services and communicate directly.
<i>Metadata</i>	information which describes information in a structured fashion. A card catalogue is a form of metadata. New metadata schema for electronic resources include the Dublin Core and the Government Information Locator Service.
<i>Published material</i>	refers to an information product which has been created and edited for the purpose of distribution or sale. Material published by or for government institutions is deposited in federal library collections.
<i>Profile</i>	a document which defines the schema used for a particular application or database.
<i>Scalable</i>	refers to the ability of something to successfully accommodate growth in some domain.

Annex 7: Selected References

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